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14 STATE OF CALIFORNIA
15 STATE WATER RESOURCES CONTROL BOARD

16 In the Matter of the Petition of NRDC and San)	PETITION FOR REVIEW OF SAN
17 Diego Coastkeeper for Review of Action by the)	DIEGO REGIONAL WATER
18 California Regional Water Quality Control)	QUALITY CONTROL BOARD
19 Board, San Diego Region, and by its Executive)	APPROVAL OF COUNTYWIDE
20 Officer, in Approving the Countywide Model)	MODEL SUSMP PURSUANT TO
21 SUSMP to Implement the Requirements of the)	ORDER NO. R9-2007-0001,
22 San Diego Regional Municipal Stormwater)	NPDES NO. CAS0108758
23 Permit, Order No. R9-2007-0001, NPDES No.)	
24 CAS0108758)	
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25 Pursuant to Section 13320 of the California Water Code and Section 2050 of Title 23 of the
26 California Code of Regulations, the Natural Resources Defense Council (“NRDC”) and San Diego
27 Coastkeeper (“Coastkeeper”) hereby petition the State Water Resources Control Board (“State
28 Board”) to review the final decision of the Executive Officer of the California Regional Water
Quality Control Board for the San Diego Region (“Regional Board” or “Board”) to approve the
Countywide Model Standard Urban Stormwater Mitigation Plan requirements (“Model SUSMP”).
The Model SUSMP is intended to implement obligations established by San Diego County’s

1 municipal separate storm sewer system permit, Order No. R9-2007-0001, NPDES No.
2 CAS0108758 (“Permit”). The Regional Board’s Executive Officer issued a final finding of
3 adequacy for the Model SUSMP on March 25, 2009.

4 The Permit regulates stormwater discharges from municipal separate storm sewer systems
5 (MS4s) and other designated stormwater discharges within a defined portion of San Diego County.
6 The County of San Diego is the principal permittee and the incorporated cities as well as the San
7 Diego Unified Port District and the San Diego County Regional Airport Authority are Co-
8 permittees. The Permit covers approximately 2,820 square miles in 10 watersheds, including
9 unincorporated areas and 18 cities.

10 In July 1990, the Regional Board adopted Order No. 90-42, which granted an NPDES
11 municipal stormwater permit for urban runoff discharges to the County of San Diego County and
12 the Co-permittees. The Regional Board renewed the Permit in 2001 by adopting Order No. 2001-
13 01, NPDES No. CAS0108758, which expired on February 21, 2006. The current Permit, Order
14 No. R9-2007-0001, NPDES No. CAS0108758, became effective on January 24, 2007. One of its
15 provisions, Section D.1.d.(8), requires the permittees to “develop and submit an updated Model
16 SUSMP that defines minimum LID [low impact development] and other BMP requirements....
17 The purpose of the updated Model SUSMP [is] to establish minimum standards to maximize the
18 use of LID practices and principles....”

19
20 1. NAME, ADDRESS, TELEPHONE NUMBER, AND E-MAIL ADDRESS OF THE
21 PETITIONERS:

22 Natural Resources Defense Council, Inc.
23 1314 Second Street
24 Santa Monica, California 90401
25 Attention: David S. Beckman, Esq. (dbeckman@nrdc.org)
26 Bart Lounsbury, Esq. (blounsbury@nrdc.org)
27 (310) 434-2300

28 San Diego Coastkeeper
2825 Dewey Road, Suite 200
San Diego CA 92106
Attention: Gabriel Solmer, Esq. (gabe@sdcoastkeeper.org)
(619) 758-7743

1 2. THE SPECIFIC ACTION OR INACTION OF THE REGIONAL BOARD WHICH THE
2 STATE BOARD IS REQUESTED TO REVIEW AND A COPY OF ANY ORDER OR
3 RESOLUTION OF THE REGIONAL BOARD WHICH IS REFERRED TO IN THE
4 PETITION:

5 NRDC and Coastkeeper (“Petitioners”) seek review of the Regional Board Executive
6 Officer’s March 25, 2009, approval of the Model SUSMP. A copy of the Model SUSMP is
7 attached as Exhibit A. A copy of the Executive Officer’s approval letter is attached as Exhibit B.

8 Because this Board’s regulations, and its own interpretations of those regulations, do not
9 clearly state whether recourse for alleged unlawful action by the Executive Officer in the
10 implementation of a permit is with the Regional Board or with this Board in the first instance,
11 NRDC and Coastkeeper are simultaneously requesting that the Regional Board hold a hearing to
12 review and reverse (or add conditions to) the Executive Officer’s approval. Petitioners will
13 request that the State Board place the instant petition in abeyance pending the Regional Board’s
14 review of our request to review this matter so as to assure that review is efficient and orderly.

15 3. THE DATE ON WHICH THE REGIONAL BOARD ACTED OR REFUSED TO ACT
16 OR ON WHICH THE REGIONAL BOARD WAS REQUESTED TO ACT:

17 March 25, 2009.

18
19 4. A FULL AND COMPLETE STATEMENT OF THE REASONS THE ACTION OR
20 FAILURE TO ACT WAS INAPPROPRIATE OR IMPROPER:

21 In approving the Model SUSMP, the Executive Officer failed to assure that it implemented
22 relevant conditions contained in the Permit, and in so doing, the Executive Officer failed to act in
23 accordance with relevant governing law, acted arbitrarily and capriciously, without substantial
24 evidence, and without adequate findings. Specifically, but without limitation:

25 A. The Regional Board and/or the Executive Officer failed to ensure that the
26 Model SUSMP, which implements critical elements of the Permit, satisfies
27 the Clean Water Act’s mandate to require “controls to reduce the discharge
28 of pollutants to the maximum extent practicable.”

- 1 B. The Regional Board and/or the Executive Officer failed to ensure that the
2 Model SUSMP implements Permit Section D.1.d.(8), which requires the
3 Co-permittees to “develop and submit an updated Model SUSMP that
4 defines minimum LID [low impact development] and other BMP
5 requirements.... [and to] establish minimum standards to maximize the use
6 of LID practices and principles...”
- 7 C. The Regional Board and/or the Executive Officer otherwise failed to require
8 that projects implement technically feasible and superior stormwater
9 management BMPs onsite in all scenarios and to require that equivalent
10 performance be guaranteed through alternative compliance measures
11 wherever onsite compliance is infeasible.
- 12 D. The Regional Board and/or the Executive Officer acted without authority to
13 approve the Model SUSMP, which sets forth material obligations and,
14 therefore, should have been subjected to Regional Board review.
- 15 E. The Regional Board and/or the Executive Officer failed to follow applicable
16 requirements that provide for meaningful public input and review of the
17 substance of permitting actions, including essential implementation
18 documents such as the Model SUSMP.
- 19 F. The Regional Board and/or the Executive Officer acted without adequate
20 findings and without substantial evidence in the record to support approval
21 of the Model SUSMP.

22

23 5. THE MANNER IN WHICH THE PETITIONERS ARE AGGRIEVED:

24

25 Petitioner NRDC is a non-profit, environmental organization that has a direct interest in
26 protecting, *inter alia*, the quality of San Diego County’s inland and coastal waters. NRDC
27 represents approximately 100,000 members in California, approximately 8,000 of whom reside in
28 the San Diego Region. NRDC’s members are aggrieved by the Model SUSMP’s inadequacy to

1 control polluted urban runoff and to support the beneficial uses of receiving waters in accordance
2 with the Clean Water Act. In particular, Petitioner's members directly benefit from San Diego
3 County waters in the form of recreational swimming, surfing, photography, birdwatching, and
4 boating.

5 Petitioner Coastkeeper is a non-profit public benefit corporation, organized and existing
6 under the laws of the State of California, with its principal place of business in San Diego,
7 California. Coastkeeper brings this petition on its own behalf and on behalf of its more than 6,000
8 members who live in San Diego County and who regularly use San Diego County waters for
9 purposes including surfing, fishing, hiking, sunbathing, water sports, and passively enjoying
10 nature. Coastkeeper meets all standing requirements for prosecuting this petition, is beneficially
11 interested in the subject matter of this petition, and will be adversely affected by the environmental
12 impacts of the Regional Board and/or Executive Officer's actions. Much of Coastkeeper's work is
13 focused on the protection of water resources in the San Diego region. Coastkeeper engages in
14 community activism, participates in governmental hearings, and educates the public about
15 environmental impacts on oceans and beaches. The interests that Coastkeeper seeks to protect are
16 germane to its fundamental purpose.

17 The Regional Board's failure to adequately control urban stormwater runoff through the
18 Permit, in the first instance,¹ and now through the Model SUSMP, has enormous consequences for
19 the region and its residents. Urban stormwater runoff is one of the most significant sources of
20

21 ¹ In 2007, NRDC filed an appeal of the Regional Board's issuance of the Permit. NRDC placed
22 that appeal in abeyance pending the formulation of the Model SUSMP. After the Regional Board
23 reviews and acts on our request to hold a hearing regarding the Executive Officer's March 25
24 approval of the Model SUSMP, Petitioners will determine whether to request that the State Board
25 activate both petitions regarding the Permit and its implementation.
26
27
28

1 pollution in coastal and other receiving waters of the United States, and it is a particularly severe
2 problem in the San Diego region. Pollutants in stormwater runoff adversely impact aquatic
3 animals and plant life in receiving waters and can cause serious human health impacts. The San
4 Diego region's water quality has worsened in the last two decades, and monitoring data show that
5 urban runoff is a primary cause of water quality impairment in the region.
6

7 Urban development increases impervious land cover and exacerbates problems associated
8 with stormwater volume, rate, and pollutant loading. Consequently, the San Diego region's rapid
9 rate of urbanization and persistent water quality problems demand that the most effective storm
10 water management tools be required immediately. Scientific studies submitted to the Regional
11 Board during the permitting process demonstrate that LID practices are the most effective tools for
12 controlling stormwater runoff volume and pollutant loading. While the Permit fails to require
13 adequate controls for new and redevelopment, the Model SUSMP makes matters worse by failing
14 to implement the controls that are required by the Permit. All of these documented facts
15 demonstrate the considerable negative impact on Petitioners' members and the environment that
16 continues today as a result of the Regional Board Executive Officer's approval of the Model
17 SUSMP.
18

19 6. THE SPECIFIC ACTION BY THE STATE OR REGIONAL BOARD WHICH
20 PETITIONER REQUESTS:

21 Petitioners seek an Order by the State Board that:

22 Overturns the Regional Board Executive Officer's approval of the Model SUSMP;

23 and

24 Remands the matter to the Regional Board with specific direction to the Regional
25 Board to impose specific, minimum requirements that maximize LID and that
26 otherwise meet the requirements of the Permit.

27 ///

28 ///

1 7. A STATEMENT OF POINTS AND AUTHORITIES IN SUPPORT OF LEGAL ISSUES
2 RAISED IN THE PETITION:

3 See Section 4, above. Petitioners request that this Petition be held in abeyance, and reserve
4 the right to supplement the legal arguments and authorities in support of this Petition.

5
6 8. A STATEMENT THAT THE PETITION HAS BEEN SENT TO THE APPROPRIATE
7 REGIONAL BOARD AND TO THE DISCHARGERS, IF NOT THE PETITIONER:

8 A true and correct copy of this petition was mailed via First Class mail on April 22, 2009 to
9 the Regional Board and to the Principal Permittees.

10
11 9. A STATEMENT THAT THE SUBSTANTIVE ISSUES OR OBJECTIONS RAISED IN
12 THE PETITION WERE RAISED BEFORE THE REGIONAL BOARD, OR AN
13 EXPLANATION OF WHY THE PETITIONER WAS NOT REQUIRED OR WAS
14 UNABLE TO RAISE THESE SUBSTANTIVE ISSUES OR OBJECTIONS BEFORE
15 THE REGIONAL BOARD.

16 All of the substantive issues and objections raised herein were presented to the Executive
17 Officer while the Model SUSMP was under consideration. Petitioners submitted written
18 comments on April 11, 2008; September 9, 2008; October 14, 2008; November 7, 2008; and
19 February 23, 2009.

20 ///

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1 Respectfully submitted via electronic mail and Federal Express,
2

3 Dated: April 22, 2009

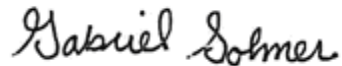
NATURAL RESOURCES DEFENSE
COUNCIL, INC.

5 

6 _____
7 David S. Beckman
8 Bart Lounsbury
Counsel for the Natural Resources Defense
Council, Inc.

9 Dated: April 22, 2009

SAN DIEGO COASTKEEPER

11 

12 _____
13 Gabriel Solmer
14 Counsel for San Diego Coastkeeper
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On April 22, 2009 I served the within document described as **PETITION FOR REVIEW OF SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD APPROVAL OF COUNTYWIDE MODEL SUSMP PURSUANT TO ORDER NO. R9-2007-0001, NPDES NO. CAS0108758** on the interested parties in said action by placing a true copy thereof in the United States mail enclosed in a sealed envelope with postage prepaid, addressed as follows:

**John Robertus, Executive Officer
San Diego Regional Water Quality
Control Board
9174 Sky Park Court
San Diego, CA 92124-1331**

I am "readily familiar" with the firm's practice of collection and processing correspondence for mailing. It is deposited with U.S. postal service on that same day in the ordinary course of business. I am aware that on motion of party served, service is presumed invalid if postal cancellation date or postage meter date is more than 1 day after date of deposit for mailing in affidavit.

Executed on April 22, 2009 at Santa Monica, California.

Petition for Review – Page 9

Exhibit A

COUNTYWIDE MODEL SUSMP

*Standard Urban Stormwater Mitigation Plan
Requirements for Development Applications*

January 2, 2009

Visit www.projectcleanwater.org for updates.

STATEMENT OF CERTIFICATION

Updated Model Standard Urban Stormwater Management Plan

I certify, under penalty of law, that this **Updated Model Standard Urban Stormwater Management Plan** and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

This document was reviewed and approved by the Copermittees of Order No. R9-2007-0001, NPDES No. CAS0108758, on January 15, 2009.

Chandra Wallar

CHANDRA L. WALLAR

Deputy Chief Administrative Officer
County of San Diego

1-21-09

Date

Countywide Model SUSMP

Project Clean Water

Cid Tesoro

Sara Agahi

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Prepared with assistance from Brown and Caldwell

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JANUARY 2, 2009

Updated Countywide Model Standard Urban Stormwater Mitigation Plan (SUSMP)

SUMMARY

In January 2007, the California Regional Water Quality Control Board for the San Diego Region (Regional Water Board) reissued a municipal stormwater NPDES permit to San Diego area municipal Copermittees. The reissued permit updates and expands stormwater requirements for new developments and redevelopments. Stormwater treatment requirements have been made more widely applicable and more stringent; minimum standards for Low Impact Development (LID) have been added, and the Copermittees are required to develop and implement criteria for the control of runoff peaks and durations from development sites.

Low Impact Development is an integrated site design methodology that uses small-scale detention and retention to minimize pollutants conveyed by runoff and to mimic pre-project site hydrological conditions.

As required by the reissued permit, the Copermittees have prepared an updated Countywide Model SUSMP to replace the current countywide model SUSMP, which has been in effect since 2002. Each municipality will update its local SUSMP to implement the requirements. To assist the land development community, to streamline project reviews, and to maximize cost-effective environmental benefits, the updated Countywide Model SUSMP incorporates a unified LID design procedure. This design procedure integrates site planning and design measures with engineered, small-scale Integrated Management Practices (IMPs) such as bioretention. By following the procedure, applicants can develop a single integrated design which complies with the complex and overlapping NPDES permit LID requirements, stormwater treatment requirements, and runoff peak-and-duration-control (hydromodification management) requirements.

Along with the detailed design procedure, the updated Countywide Model SUSMP includes design information and criteria for dispersal of runoff to landscaped areas and for pervious pavements, bioretention facilities, flow-through planters, dry wells, infiltration basins, and cisterns. Where feasible and where allowed, water in cisterns may be directed to nonpotable uses, augmenting water supplies. Bioretention facilities and planter boxes can be designed with an impermeable barrier so that runoff does not saturate native soils; instead, runoff is filtered through an engineered soil mix before being captured in an underdrain and conveyed to off-site storm drains. This configuration may be needed where groundwater is high, is contaminated, or where increasing soil moisture may present a hazard to foundations or slope stability.

Applicants for development project approvals may choose not to use the unified LID design procedure; however, they will still need to demonstrate compliance with the applicable LID criteria, stormwater treatment criteria, and hydromodification management criteria. The updated Countywide Model SUSMP requires that runoff be infiltrated or else treated by bioretention facilities, planter boxes, filters, settling ponds, or constructed wetlands. In some special circumstances—retrofit of existing drainage systems, some pedestrian-oriented developments, and roadway widening projects—where it can also be demonstrated it is not be feasible to construct any of these facilities, higher-rate surface biofilters or higher-rate vault-based filtration units may be used.

Applicants for approval of Priority Development Projects must demonstrate compliance with the hydromodification management criteria in the NPDES permit. The updated Countywide Model SUSMP includes guidance for demonstrating compliance. Submittals for projects smaller than 50 acres may demonstrate compliance by using the integrated LID design procedure. For larger projects, the applicant may use a continuous simulation hydrologic computer model to

simulate pre-project and post-project runoff, including the effect of LID facilities, detention basins, or other stormwater management facilities, or may identify an exemption applicable to the site.

Applicants must also incorporate into their project design features to control pollutants from specified on-site sources, such as refuse areas, outdoor storage areas, and vehicle washing and repair facilities. The Copermittees have developed a table listing the types of sources to be controlled and for each, the corresponding source control measures required.

The updated Countywide Model SUSMP provides the applicant with step-by-step instructions for preparing a Project Submittal for review by the municipal staff. The recommended steps are:

1. Assemble needed information.
2. Identify site opportunities and constraints.
3. Follow the LID Design Guidance to analyze the project for LID and to develop and document the drainage design.
4. Specify source controls using the sources/source control checklist in the appendix.
5. Plan for ongoing maintenance of treatment and flow-control facilities.
6. Complete the Project Submittal.

The step-by-step instructions are augmented by an example checklist which municipal staff may use as a guide when reviewing the Project Submittal. The SUSMP also includes an example project submittal outline and contents. As stated in the SUSMP, municipalities may adapt these submittal requirements to their own needs and procedures.

As required by the reissued NPDES permit, each Copermittee implements a program to verify that approved stormwater treatment facilities are operating effectively. To facilitate implementation of these programs, the updated Countywide Model SUSMP includes instructions for applicants to prepare detailed maintenance plans.

The updated Countywide Model SUSMP is available for download in .pdf format at www.projectcleanwater.org. The 126-page document is formatted for 2-sided printing, and may also be navigated online. Hyperlinks throughout the document provide ready access to references and additional information resources.

Table of Contents

GLOSSARY

HOW TO USE THE MODEL SUSMP	1
▶ Plan Ahead to Avoid the Three Most Common mistakes	2

CHAPTER 1. POLICIES AND PROCEDURES	3
A Low Impact Development Design Procedure	3
Requirements for All Development Projects	4
Priority Development Projects	4
▶ New Development	4
▶ Previously developed sites	6
▶ The "50% Rule" for previously developed projects	6
Compliance Process at a Glance	6
Phased Projects	7
New Subdivisions	8
Compliance with Flow-Control Requirements	9
▶ Option 1: Continuous simulation	10
▶ Option 2: LID Integrated Management Practices	11
▶ Option 3: Exemption from Hydromodification Management	11
Waivers from Numeric Sizing Criteria	12
CHAPTER 2. CONCEPTS AND CRITERIA	13
Water-Quality Regulations	14
▶ Maximum Extent Practicable	15
▶ Best Management Practices	15
Pollutants of Concern	16
▶ Grouping of Potential Pollutants of Concern	16
▶ Identifying Pollutants of Concern Based on Land Uses	18
▶ Watersheds with Special Pollutant Concerns	18
Selection of Permanent Source Control BMPs	21
Selection of Stormwater Treatment Facilities	21
Hydrology for NPDES Compliance	24

	► Imperviousness	24
	► Low Impact Development Requirements	25
	► Sizing Requirements for Stormwater Treatment Facilities	25
	► Flow-Control (Hydromodification Management)	26
	Criteria for Infiltration Devices	27
	► Most LID Features and Facilities are Not Infiltration Devices	28
	Environmental and Economic Benefit Perspective	28
CHAPTER 3.	PREPARING YOUR PROJECT SUBMITTAL	31
	Example Project Submittal CHECKLIST	32
	Contents of EXHIBIT	32
	• Step by Step	33
	Step 1: Assemble Needed Information	33
	Step 2: Identify Constraints & Opportunities	34
	Step 3: Prepare and Document Your LID Design	35
	Step 4. Specify Source Control BMPs	36
	► Identify Pollutant Sources	36
	► Note Locations on Submittal Drawing	37
	► Prepare a Table and Narrative	37
	► Identify Operational Source Control BMPs	37
	Step 5: Stormwater Facility Maintenance	38
	Step 6: Complete Your Project Submittal	38
	► Coordination with Site, Architectural, and Landscaping Plans	39
	► Construction Plan SUSMP checklist	39
	► Certification	40
	► Example Project submittal Outline and Contents	41
	► Example Project Submittals	42
CHAPTER 4.	LOW IMPACT DEVELOPMENT DESIGN GUIDE	43
	Analyze Your Project for LID	44
	► Optimize the Site Layout	46
	► Use Pervious Surfaces	47
	► Disperse Runoff to Adjacent Pervious Areas	47
	► Direct runoff to Integrated Management Practices	47
	Develop and Document Your Drainage Design	49
	► Step 1: Delineate Drainage Management Areas	50
	► Step 2: Classify DMAs and determine runoff factors	50
	► Step 3: Tabulate Drainage Management Areas	53
	► Step 4: Select and Lay Out IMPs on Site Plan	54
	► Step 5: Review Sizing for Each IMP	54
	► Step 6: Calculate minimum area and Volume of each IMP	55

▶ Step 7: Determine if available space for IMP is adequate	56
▶ Step 8: Complete Your Summary Report	57
Specify Preliminary Design Details	59
Alternatives to Integrated LID Design	59
▶ Design of Alternative treatment Facilities	60
▶ Treatment Facilities for Special Circumstances	62
CHAPTER 5. OPERATION & MAINTENANCE OF STORMWATER FACILITIES	91
Stage 1: Ownership and Responsibility	92
▶ Private Ownership and Maintenance	92
▶ Transfer to Public Ownership	93
Stage 2: General Maintenance Requirements	94
Stage 3: Detailed Maintenance Plan	95
▶ Your Detailed Maintenance Plan: Step by Step	95
▶ Step 1: Designate Responsible Individuals	95
▶ Step 2: Summarize Drainage and BMPs	96
▶ Step 3: Document Facilities "As Built"	96
▶ Step 4: Prepare Maintenance Plans for Each Facility	97
▶ Step 5: Compile Maintenance Plan	98
▶ Step 6: Updates	100
Stage 4: Interim Maintenance	100
Stage 5: Transfer Responsibility	100
Stage 6: Operation & Maintenance Verification	100

BIBLIOGRAPHY

APPENDIX: POLLUTANT SOURCES AND SOURCE CONTROL CHECKLIST

Figures

<u>FIGURE 4-1</u> SELF-TREATING AREAS	50
<u>FIGURE 4-2</u> SELF-RETAINING AREAS	51
<u>FIGURE 4-3</u> RELATIONSHIP OF IMPERVIOUS TO PERVIOUS AREA	51
<u>FIGURE 4-4</u> MORE THAN ONE DMA CAN DRAIN TO ONE IMP	53
<u>FIGURE 4-5</u> ONE DMA CANNOT DRAIN TO MORE THAN ONE IMP.....	53

Tables

TABLE 1-1	PRIORITY DEVELOPMENT PROJECTS	5
TABLE 2-1	ANTICIPATED AND POTENTIAL POLLUTANTS BY LAND USE	19
TABLE 2-2	GROUPING OF POTENTIAL POLLUTANTS OF CONCERN	21
TABLE 2-3	GROUPS OF POLLUTANTS AND RELATIVE EFFECTIVENESS OF FACILITIES	22
TABLE 3-1	FORMAT FOR TABLE OF SOURCE CONTROL MEASURES	37
TABLE 3-2	CONSTRUCTION PLAN CHECKLIST	32
TABLE 4-1	IDEAS FOR RUNOFF MANAGEMENT	47
TABLE 4-2	RUNOFF FACTORS	52
TABLE 4-3	FORMAT FOR TABULATING SELF-TREATING AREAS.....	54
TABLE 4-4	FORMAT FOR TABULATING SELF-RETAINING AREAS	54
TABLE 4-5	FORMAT FOR TABULATING AREAS DRAINING TO SELF-RETAINING AREAS	54
TABLE 4-6	SIZING FACTORS	54
TABLE 4-7	FORMAT FOR PRESENTING CALCULATIONS OF IMP AREAS AND VOLUMES	55
TABLE 5-1	SCHEDULE FOR PLANNING BMP OPERATION AND MAINTENANCE	92

Checklists

SUBMITTAL CHECKLIST	32
SOURCES AND SOURCE CONTROL BMP CHECKLIST	APPENDIX

Design Sheets

SELF-TREATING AND SELF-RETAINING AREAS.....	53
PERVIOUS PAVEMENTS	57
BIORETENTION FACILITIES	61
FLOW-THROUGH PLANTERS	71
DRY WELLS AND INFILTRATION FACILITIES	77

Glossary

Best Management Practice (BMP)	Any procedure or device designed to minimize the quantity of pollutants that enter the storm drain system.
California Association of Stormwater Quality Agencies (CASQA)	Publisher of the California Stormwater Best Management Practices Handbooks, available at www.cabmphandbooks.com . Successor to the Storm Water Quality Task Force (SWQTF).
California BMP Method	A method for determining the required volume of stormwater treatment facilities. Described in Section 5.5.1 of the California Stormwater Best Management Practice Manual (New Development) (CASQA, 2003).
Conditions of Approval (COAs)	Requirements a municipality may adopt for a project in connection with a discretionary action (e.g., adoption of an EIR or negative declaration or issuance of a use permit). COAs may include features to be incorporated into the final plans for the project and may also specify uses, activities, and operational measures that must be observed over the life of the project.
Continuous Simulation Modeling	A method of hydrological analysis in which a set of rainfall data (typically hourly for 30 years or more) is used as input, and runoff rates are calculated on the same time step. The output is then analyzed statistically for the purposes of comparing runoff patterns under different conditions (for example, pre- and post-development-project).
Copermittees	See Dischargers .
Detention	The practice of holding stormwater runoff in ponds, vaults, within berms, or in depressed areas and letting it discharge slowly to the storm drain system. See definitions of infiltration and retention .
Directly Connected Impervious Area	Any impervious surface which drains into a catch basin, area drain, or other conveyance structure without first allowing flow across pervious areas (e.g. lawns).
Direct Infiltration	Infiltration via methods or devices, such as dry wells or infiltration trenches, designed to bypass unsaturated surface soils and transmit runoff directly to groundwater.
Dischargers	The agencies named in the stormwater NPDES permit (see definition): the County of San Diego; the Cities of Carlsbad, El Cajon, La Mesa, Poway, Solana Beach, Chula Vista, Encinitas, Lemon Grove, San Diego, Vista, Coronado, Escondido, National City, San Marcos, Del Mar, Imperial Beach, Oceanside, and Santee; the San Diego Unified Port District, and the San Diego County Regional Airport Authority.

Drainage Management Areas	Areas delineated on a map of the development site showing how drainage is detained, dispersed, or directed to Integrated Management Practices . There are four types of Drainage Management Areas, and specific criteria apply to each type of area. See Chapter 4.
Drawdown time	The time required for a stormwater detention or infiltration facility to drain and return to the dry-weather condition. For detention facilities, drawdown time is a function of basin volume and outlet orifice size. For infiltration facilities, drawdown time is a function of basin volume and infiltration rate.
Environmentally Sensitive Areas	Areas that include but are not limited to all Clean Water Act Section 303(d) impaired water bodies; areas designated as Areas of Special Biological Significance by the State Water Resources Control Board (Water Quality Control Plan for the San Diego Basin (1994) and amendments); water bodies designated with the RARE beneficial use by the State Water Resources Control Board (Water Quality Control Plan for the San Diego Basin (1994) and amendments); areas designated as preserves or their equivalent under the Multi Species Conservation Program within the Cities and County of San Diego; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees.
Flow Control	Control of runoff rates and durations as required by the Hydromodification Management Plan.
Head	In hydraulics, energy represented as a difference in elevation. In slow-flowing open systems, the difference in water surface elevation, e.g., between an inlet and outlet.
Higher-Rate Biofilter	A biofilter with a design surface loading rate higher than the 5 inches per hour rate specified in this document for bioretention facilities and planter boxes.
Hydrograph	Runoff flow rate plotted as a function of time.
Hydromodification Management Plan (HMP)	A Plan implemented by the dischargers so that post-project runoff shall not exceed estimated pre-project rates and/or durations, where increased runoff would result in increased potential for erosion or other adverse impacts to beneficial uses. Also see definition for flow control .
Hydrologic Soil Group	Classification of soils by the Natural Resources Conservation Service (NRCS) into A, B, C, and D groups according to infiltration capacity.
Impervious surface	Any material that prevents or substantially reduces infiltration of water into the soil. See discussion of imperviousness in Chapter Two.

Infeasible	As applied to best management practices, impossible to implement because of technical constraints specific to the site.
Infiltration	Seepage of runoff into soils underlying the site. See definition of retention .
Infiltration Device	Any structure, such as a dry well, that is designed to infiltrate stormwater into the subsurface and, as designed, bypasses the natural groundwater protection afforded by surface or near-surface soil. See definition for direct infiltration .
Integrated Management Practice (IMP)	A facility (BMP) that provides small-scale treatment, retention, and/or detention and is integrated into site layout, landscaping and drainage design. See Low Impact Development .
Integrated Pest Management (IPM)	An approach to pest management that relies on information about the life cycles of pests and their interaction with the environment. Pest control methods are applied with the most economical means and with the least possible hazard to people, property, and the environment.
Interim Hydromodification Criteria	Pursuant to NPDES permit Provision D.1.d.g.(6), the Copermittees prepared Interim Hydromodification Management criteria, which apply to projects disturbing 50 acres or more. The criteria are described in Chapter 2 and in memoranda on the Project Clean Water website.
Jurisdictional Urban Runoff Management Plan (JURMP)	A written description of the specific jurisdictional urban runoff management measures and programs that each Copermittee implements to comply with the stormwater NPDES permit and ensure pollutant discharges are reduced to the MEP and do not cause or contribute to a violation of water quality standards. See Stormwater Pollution Prevention Program .
Lead Agency	The public agency that has the principal responsibility for carrying out or approving a project. (CEQA Guidelines §15367).
Low Impact Development	An integrated site design methodology that uses small-scale detention and retention (Integrated Management Practices, or IMPs) to mimic pre-existing site hydrological conditions.
Maximum Extent Practicable (MEP)	Standard, established by the 1987 amendments to the Clean Water Act, for the implementation of municipal stormwater pollution prevention programs (see definition). According to the Act, municipal stormwater NPDES permits "shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."

COUNTYWIDE MODEL SUSMP

National Pollutant Discharge Elimination System (NPDES)	As part of the 1972 Clean Water Act, Congress established the NPDES permitting system to regulate the discharge of pollutants from municipal sanitary sewers and industries. The NPDES was expanded in 1987 to incorporate permits for stormwater discharges as well.
Numeric Criteria	Sizing requirements for stormwater treatment facilities established in Provision D.1.d.(6)(c) of the San Diego RWQCB's stormwater NPDES permit.
Operation and Maintenance (O&M)	Refers to requirements in the Stormwater NPDES Permit to inspect treatment BMPs and implement preventative and corrective maintenance in perpetuity. See Chapter Five.
Parking Lot	A land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.
Permeable Pavements	Pavements for roadways, sidewalks, or plazas that are designed to infiltrate a portion of rainfall, including pervious concrete, pervious asphalt, unit-pavers-on-sand, and crushed gravel.
Priority Development Project	A project subject to SUSMP requirements. Defined in Stormwater NPDES Permit Provision D.1.d.(1). See Chapter One.
Project Area	The entire project area comprises all areas to be altered or developed by the project, plus any additional areas that drain on to areas to be altered or developed.
Project Submittal	Documents submitted to a municipality in connection with an application for development approval and demonstrating compliance with Stormwater NPDES Permit requirements for the project. Specific requirements vary from municipality to municipality.
Proprietary	A proprietary device is one marketed under legal right of the manufacturer.
Redevelopment	The creation, addition, and or replacement of impervious surface on an already developed site. Examples include the expansion of a building footprint, road widening, the addition to or replacement of a structure, and creation or addition of impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Redevelopment does not include trenching and resurfacing associated with utility work; resurfacing and reconfiguring surface parking lots and existing roadways; new sidewalk construction, pedestrian ramps, or bikelane on existing roads; and routine replacement of damaged pavement, such as pothole repair.

Rational Method	A method of calculating runoff flows based on rainfall intensity, tributary area, and a factor representing the proportion of rainfall that runs off.
Regional (or Watershed) Stormwater Treatment Facility	A facility that treats runoff from more than one project or parcel.
Regional Water Quality Control Board (Regional Water Board or RWQCB)	California RWQCBs are responsible for implementing pollution control provisions of the Clean Water Act and California Water Code within their jurisdiction. There are nine California RWQCBs.
Retention	The practice of holding stormwater in ponds or basins, or within berms or depressed areas, and allowing it to slowly infiltrate into underlying soils. Some portion will evaporate. See definitions for infiltration and detention .
Self-retaining area	An area designed to retain runoff. Self-retaining areas may include graded depressions with landscaping or pervious pavements and may also include tributary impervious areas up to a 2:1 impervious-to-pervious ratio.
Self-treating area	A natural, landscaped, or turf area drains directly off site or to the public storm drain system.
Source Control	Land use or site planning practices, or structural or nonstructural measures that aim to prevent urban runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and urban runoff.
Standard Industrial Classification (SIC)	A Federal government system for classifying industries by 4-digit code. It is being supplanted by the North American Industrial Classification System but SIC codes are still referenced by the Regional Water Board in identifying development sites subject to regulation under the NPDES permit. Information and an SIC search function are available at http://www.bls.gov/bls/NAICS.htm
Stormwater NPDES Permit	A permit issued by a Regional Water Quality Control Board (see definition) to local government agencies (Dischargers) placing provisions on allowable discharges of municipal stormwater to waters of the state.
Storm Water Pollution Prevention Plan (SWPPP)	A plan providing for temporary measures to control sediment and other pollutants during construction as required by the statewide stormwater NPDES permit for construction activities.

COUNTYWIDE MODEL SUSMP

Stormwater Pollution Prevention Program	A comprehensive program of activities designed to minimize the quantity of pollutants entering storm drains. See Jurisdictional Urban Runoff Management Plan .
Standard Urban Stormwater Mitigation Plan (SUSMP)	Refers to various documents prepared in connection with implementation of the stormwater NPDES permit mandate to control pollutants from new development and redevelopment. Each discharger will adapt this model countywide SUSMP to create a local SUSMP for their respective jurisdiction. Applicants for development project approvals will use the local SUSMP to prepare a submittal for each Priority Development Project they propose.
Treatment	Removal of pollutants from runoff, typically by filtration or settling.
Water Board	See Regional Water Quality Control Board .
Water Quality Volume (WQV)	For stormwater treatment facilities that depend on detention to work, the volume of water that must be detained to achieve maximum extent practicable pollutant removal. This volume of water must be detained for a specified drawdown time .







How to Use the SUSMP

Review Chapters 1 and 2 to get a general understanding of the requirements. Then follow step-by-step instructions in Chapter 3 to prepare your Project Submittal.

THIS *Standard Urban Stormwater Mitigation Plan (SUSMP)* will help you ensure your project complies with the California Regional Water Quality Control Boards' requirements. Most applicants will require the assistance of a qualified civil engineer, architect, and/or landscape architect. Because every project is different, you should begin by checking specific requirements with municipal staff.

ICON KEY

-  Helpful Tip
 -  Submittal Requirement
 -  Terms to Look Up
 -  References & Resources
-

To use the *SUSMP*, start by reviewing **Chapter One** to find out whether and how stormwater quality requirements apply to your project. Chapter One also provides an overview of the process of planning, design, construction, operation, and maintenance leading to compliance.

If there are terms and issues you find puzzling, try finding answers in the glossary or in **Chapter Two**. Chapter Two provides background on key stormwater concepts and water quality regulations, including design criteria.

Then proceed to **Chapter Three** and follow the step-by-step guidance to prepare a Project Submittal for your site.

Chapter Four, the Low Impact Development Design Guide, includes design procedures, calculation procedures, and instructions for presenting your design and calculations in your Project Submittal.


In **Chapter Five** you'll find a detailed description of the process for ensuring operation and maintenance of your stormwater facilities over the life of the

project. The chapter includes step-by-step instructions for preparing a Stormwater Facilities Operation and Maintenance Plan.

Local Requirements

Cities or the County may have requirements that differ from, or are in addition to, this county-wide model SUSMP.

Throughout each Chapter, you'll find references and resources to help you understand the regulations, complete your Project, Submittal, and design stormwater control measures for your project.

The most recent, updated version of the *Model SUSMP*, including updates and errata between editions, is on the Project Clean Water website. The on-line *Model SUSMP* is in Adobe Acrobat format. If you are reading the Acrobat version on a computer with an internet connection, you can use hyperlinks to navigate the document and to access various references. The hyperlinks are throughout the text, as well as in "References and Resources" sections (marked by the  icon) and in the **Bibliography**. Some of these links (URLs) may be outdated. In that case, try entering portions of the title or other keywords into a web search engine.

Construction-Phase Controls

Your Project Submittal for SUSMP compliance is a separate document from the Storm Water Pollution Prevention Plan (SWPPP). A SWPPP provides for temporary measures to control sediment and other pollutants during construction at sites that disturb one acre or more. See the Construction Handbook at www.cabmphandbooks.org for more information on SWPPPs.

► PLAN AHEAD TO AVOID THE THREE MOST COMMON MISTAKES

The most common (and costly) errors made by applicants for development approvals with respect to stormwater quality compliance are:

1. Not planning for compliance early enough. You should think about your strategy for stormwater quality compliance before completing a conceptual site design or sketching a layout of subdivision lots (Chapter 3).
2. Assuming proprietary stormwater treatment facilities will be adequate for compliance. Most aren't (Chapter 2).
3. Not planning for periodic inspections and maintenance of treatment and flow-control facilities. Consider who will own and who will maintain the facilities in perpetuity and how they will obtain access, and identify which arrangements are acceptable to your municipality (Chapter 5).



Policies and Procedures

Determine if your development project must comply with stormwater quality requirements, and review the steps to compliance.

A Low Impact Development Design Procedure

The San Diego Regional Water Board reissued a municipal stormwater NPDES permit to the municipal **Copermittees** in January 2007. The permit updates and expands stormwater requirements for new developments and redevelopments. Stormwater treatment requirements have been made more stringent, minimum standards for **Low Impact Development (LID)** have been added, and the Copermittees are required to develop and implement criteria for the control of runoff peaks and durations from development sites.

To assist the land development community, streamline project reviews, and maximize cost-effective environmental benefits, the Copermittees have developed a unified LID design procedure. This design procedure integrates site planning and design measures with engineered, small-scale **Integrated Management Practices (IMPs)** such as bioretention. By following the procedure, applicants can develop a single integrated design which complies with the complex and overlapping NPDES permit LID requirements, stormwater treatment requirements, and flow-control (**hydromodification management**) requirements.

ICON KEY

☞ Helpful Tip

⚙ Submittal Requirement

🔍 Terms to Look Up

📖 References & Resources

The design approach is detailed in Chapter 4. General instructions for preparing a complete Project Submittal are in Chapter 3, and specific local submittal requirements are available from municipal staff.

Applicants may choose not to use this design procedure, in which case they will need to demonstrate, in their submittal, compliance with applicable LID criteria,

stormwater treatment criteria, and flow-control criteria. These criteria are described in Chapter 2 and in the NPDES permit.

Requirements for All Development Projects

All development projects must include control measures to reduce the discharge of stormwater pollutants to the maximum extent practicable.

In general, for projects that are not “Priority Development Projects,” this will include:

- Implementation of source control BMPs as listed in the Appendix.
- Inclusion of some LID features that conserve natural features, set back development from natural water bodies, minimize imperviousness, maximize infiltration, and retain and slow runoff.
- Compliance with requirements for construction-phase controls on sediment and other pollutants.

Municipal staff may also require additional controls appropriate to the project, which may include stormwater treatment controls. LID treatment controls such as infiltration or bioretention are preferred. See “Selection of Treatment Facilities” on page 21. If treatment facilities are included, provisions must be made to ensure their long-term maintenance.

**Local
Requirements**
Project Submittal
requirements vary from
project to project. Check
with municipal staff.

Priority Development Projects

The NPDES permit requires more specific criteria be applied to Priority Development Projects.

► NEW DEVELOPMENT

Projects on previously undeveloped land are Priority Development Projects if they are in one or more of the categories listed in Table 1-1.

TABLE 1-1. Priority Development Projects.

Is the project in any of these categories?

Yes <input type="checkbox"/>	No <input type="checkbox"/>	A	Housing subdivisions of 10 or more dwelling units. Examples: single-family homes, multi-family homes, condominiums, and apartments.
Yes <input type="checkbox"/>	No <input type="checkbox"/>	B	Commercial—greater than one acre. Any development other than heavy industry or residential. Examples: hospitals; laboratories and other medical facilities; educational institutions; recreational facilities; municipal facilities; commercial nurseries; multi-apartment buildings; car wash facilities; mini-malls and other business complexes; shopping malls; hotels; office buildings; public warehouses; automotive dealerships; airfields; and other light industrial facilities.
Yes <input type="checkbox"/>	No <input type="checkbox"/>	C	Heavy industry—greater than one acre. Examples: manufacturing plants, food processing plants, metal working facilities, printing plants, and fleet storage areas (bus, truck, etc.).
Yes <input type="checkbox"/>	No <input type="checkbox"/>	D	Automotive repair shops. A facility categorized in any one of Standard Industrial Classification (SIC) codes 5013, 5014, 5541, 7532-7534, or 7536-7539.
Yes <input type="checkbox"/>	No <input type="checkbox"/>	E	Restaurants. Any facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is greater than 5,000 square feet. Restaurants where land development is less than 5,000 square feet shall meet all SUSMP requirements except for structural treatment BMP and numeric sizing criteria requirements and hydromodification requirements.
Yes <input type="checkbox"/>	No <input type="checkbox"/>	F	Hillside development greater than 5,000 square feet. Any development that creates 5,000 square feet of impervious surface and is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.
Yes <input type="checkbox"/>	No <input type="checkbox"/>	G	Environmentally Sensitive Areas (ESAs). All development located within or directly adjacent to or discharging directly to an ESA (where discharges from the development or redevelopment will enter receiving waters within the ESA), which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10% or more of its naturally occurring condition. "Directly adjacent" means situated within 200 feet of the ESA. "Discharging directly to" means outflow from a drainage conveyance system that is composed entirely of flows from the subject development or redevelopment site, and not commingled with flows from adjacent lands.
Yes <input type="checkbox"/>	No <input type="checkbox"/>	H	Parking lots 5,000 square feet or more or with 15 or more parking spaces and potentially exposed to urban runoff.
Yes <input type="checkbox"/>	No <input type="checkbox"/>	I	Street, roads, highways, and freeways. Any paved surface that is 5,000 square feet or greater used for the transportation of automobiles, trucks, motorcycles, and other vehicles.
Yes <input type="checkbox"/>	No <input type="checkbox"/>	J	Retail Gasoline Outlets (RGOs) that are: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

To use the table, review each definition A through J. If any of the definitions match, the project is a **Priority Development Project**. Note some thresholds are defined by square footage of impervious area created; others by the total area of the development.

► **PREVIOUSLY DEVELOPED SITES**

Projects on previously developed sites (“**redevelopment** projects”) are Priority Development Projects if they create, add, or replace 5,000 square feet or more of impervious surface and also are in one of the categories listed in Table 1-1.

Local municipal staff may choose to designate projects not within the categories in Table 1-1 as Priority Development Projects, based on potential impacts to stormwater quality.

► **THE “50% RULE” FOR PREVIOUSLY DEVELOPED PROJECTS**

Projects on previously developed sites may also need to retrofit drainage of **all** impervious areas of the **entire** site. For sites creating or replacing more than 5,000 square feet of impervious area:

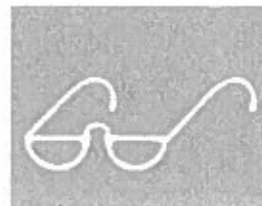
- If the new project results in an increase of, or replacement of, 50% or more of the previously existing impervious surface, and the existing development was not subject to SUSMP requirements, then the entire project must be included in the treatment measure design.
- If less than 50% of the previously impervious surface is to be affected, only that portion must be included in the treatment measure design.

If a new Development Project feature such as a parking lot falls into a Priority Development Project category, then the entire project footprint is subject to SUSMP requirements.

Projects limited to interior remodels, routine maintenance or repair, roof or exterior surface replacement, resurfacing and reconfiguring surface parking lots and existing roadways, new sidewalk construction, pedestrian ramps, or bike lanes on existing roads, and routine replacement of damaged pavement such as pothole repair are not subject to treatment requirements. However, other requirements, including incorporation of appropriate source controls, still apply.

Compliance Process at a Glance

For the applicant for development project approval, stormwater compliance follows these general steps:



1. Discuss requirements during a pre-application meeting with municipal staff.
2. Review the instructions in this *SUSMP* before you prepare your tentative map, preliminary site plan, drainage plan, and landscaping plan.
3. Prepare your **Project Submittal**, which is typically made with your application for development approvals (entitlements).
4. Create your detailed project design, incorporating the features described in your Project Submittal.
5. In a table on your construction plans, list each stormwater compliance feature and facility and the plan sheet where it appears.
6. Prepare a draft Stormwater Facility Operation and Maintenance Plan and submit it as required by your local jurisdiction.
7. Maintain stormwater facilities during construction and following construction in accordance with required warranties.
8. Following construction, formally transfer responsibility for maintenance to the owner.
9. The owner must periodically verify stormwater facilities are properly maintained.



Preparation of a complete and detailed Project Submittal is the key to cost-effective stormwater compliance and expeditious review of your project. Instructions for preparing your Project Submittal are in Chapter 3.

Phased Projects

When determining whether *SUSMP* requirements apply, a “project” should be defined consistent with California Environmental Quality Act (CEQA) definitions

Local Requirements

Cities or the County may have requirements that differ from, or are in addition to, this countywide model *SUSMP*. Check with local planning and community development staff.

of “project.” That is, the “project” is the whole of an action which has the potential for adding or replacing or resulting in the addition or replacement of roofs, pavement, or other impervious surfaces and thereby resulting in increased flows and stormwater pollutants. “Whole of an action” means the project may not be segmented or piecemealed into small parts if the effect is to reduce the quantity of impervious area for any

part to below the *SUSMP* thresholds.

Municipal staff may require, as part of an application for approval of a phased development project, a conceptual or master Project Submittal which describes and illustrates, in broad outline, how the drainage for the project will comply with the SUSMP requirements. The level of detail in the conceptual or master Project Submittal should be consistent with the scope and level of detail of the development approval being considered. The conceptual or master Project Submittal should specify that a more detailed Project Submittal for each later phase or portion of the project will be submitted with subsequent applications for discretionary approvals.

CEQA

Preparers of CEQA documents may wish to visit the Project Clean Water website for guidance on how to document stormwater impacts and mitigations in Initial Studies and Environmental Impact Reports.

Note these minimum standards for SUSMP applicability are for the purpose of ensuring a consistent minimum level or "floor" for countywide implementation consistent with the requirements of the NPDES permit. Individual municipalities may choose a more expansive interpretation of the NPDES permit's applicability and may also choose to apply source control, treatment, and flow-control requirements to projects that would be exempt under these minimum standards.

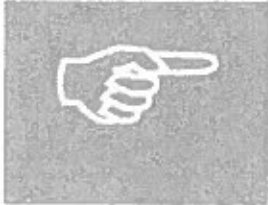
New Subdivisions

If a tentative map approval would potentially entitle future owners to construct new or replaced impervious area which, in aggregate, could exceed one of the SUSMP thresholds (Table 1-1), then the applicant must take steps to ensure SUSMP requirements can and will be implemented as the subdivision is built out.

If the tentative map application does not include plans for site improvements, the applicant should nevertheless identify the type, size, location, and final ownership of stormwater treatment and flow-control facilities adequate to serve common private roadways and any other common areas, and to also manage runoff from an expected reasonable estimate of the square footage of future roofs, driveways, and other impervious surfaces on each individual lot. The municipality may condition approval of the map on implementation of stormwater treatment and other SUSMP measures when construction occurs on the individual lots. At the municipality's discretion, this condition may be enforced by a grant deed of development rights or by a development agreement.

If a municipality deems it necessary, the future impervious area of one or more lots may be limited by a deed restriction. This might be necessary when a project is exempted from one or all SUSMP provisions because the total impervious area is below a threshold, or to ensure runoff from impervious areas added after the project is approved does not overload a stormwater treatment and flow-control facility.

Municipalities may require subdivision maps to dedicate an “open space easement, as defined by Government Code Section 51075,” to suitably restrict the future building of structures at each stormwater facility location if necessary.



In general, in new subdivisions **stormwater treatment, infiltration, or flow-control facilities should not be located on individual single-family residential lots**, particularly when those facilities manage runoff from other lots, from streets, or from common areas. A better alternative is to locate stormwater facilities on one or more separate, jointly owned parcels.

After consulting with local planning staff, applicants for subdivision approvals will propose one of the following four options, depending on project characteristics and local policies:

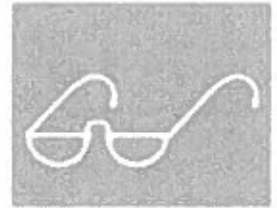
1. Show the number of parcels and the total impervious area to be created on all parcels could not, in the future, exceed any of the thresholds in Table 1-1.
2. Show that, for each and every lot, the intended use can be achieved with a design which disperses runoff from roofs, driveways, streets, and other impervious areas to self-retaining pervious areas, using the criteria in Chapter 4.
3. Prepare improvement plans showing drainage to treatment and/or flow-control facilities designed in accordance with this *SUSMP*, and commit to constructing the facilities prior to transferring the lots.
4. Prepare improvement plans showing drainage to treatment and/or flow-control facilities designed in accordance with this *SUSMP*, and provide appropriate legal instruments to ensure the proposed facilities will be constructed and maintained by subsequent owners.

For the option selected, municipal staff will determine the appropriate conditions of approval, easements, deed restrictions, or other legal instruments necessary to assure future compliance.

Compliance with Flow-Control Requirements

Priority Development Projects (Table 1-1) must be designed so that runoff rates and durations are controlled to maintain or reduce downstream erosion conditions and protect stream habitat.

For projects disturbing areas smaller than 50 acres, this can be accomplished by implementing **Low Impact Development (LID)** design using the design criteria and procedures in Chapter 4. The criteria will be updated following RWQCB approval of the Copermittees' **Hydromodification Management Plan** (see Option 2 below).



Priority Development Projects disturbing 50 acres or more must meet the following **interim hydromodification standard**:

“...post-project runoff flow rates and durations shall not exceed pre-project runoff flow rates and durations ... where the increased discharge flow rates and durations will result in increased potential for erosion or other significant adverse impacts to beneficial uses, attributable to increased flow rates and durations.”

Project Clean Water is developing a Hydromodification Management Plan (HMP) in compliance with Provision D.1.g of the NPDES Permit. As required, the Program has adopted interim hydromodification criteria which will be superseded after the HMP is accepted by the Regional Water Board.

Compliance with the interim hydromodification criteria can be achieved by one of the following options:

1. Use a continuous simulation hydrologic computer model such as USEPA's Hydrograph Simulation Program—Fortran (HSPP) to simulate pre-project and post-project runoff, including the effect of proposed IMPs, detention basins, or other stormwater management facilities, and demonstrate the standard is achieved.
2. Use Low Impact Development Integrated Management Practices to manage hydrograph modification impacts, using design procedures, criteria, and sizing factors (ratios of LID IMP volume or area to tributary area) specified by the Co-permittees.
3. Identify an exemption applicable to the site.

► **OPTION 1: CONTINUOUS SIMULATION**

Prepare an analysis of pre-project and post-project runoff following the instructions in the memoranda “Using Continuous Simulation to Size Stormwater Control Facilities” (May 9, 2008) and “Development of Interim Hydromodification Criteria” (October 30, 2007). Both memoranda are available on the Project Clean Water website.

Before preparing the analysis, discuss with municipal staff the required documentation for your Project Submittal, which will include assumptions and modeling parameters used in the analysis and a graphical presentation demonstrating compliance with the following:

1. For flow rates from 20% of the pre-project 5-year runoff event (0.2Q5) to the pre-project 10-year runoff event (Q10), the post-project discharge rates and durations shall not deviate above the pre-project rates and durations by more than 10% over and more than 10% of the length of the flow duration curve.
2. For flow rates from 0.2Q5 to Q5, the post-project peak flows shall not exceed pre-project peak flows. For flow rates from Q5 to Q10, post-project peak flows may exceed pre-project flows by up to 10% for a 1-year frequency interval. For example, post-project flows could exceed pre-project flows by up to 10% for the interval from Q9 to Q10 or from Q5.5 to Q6.5, but not from Q8 to Q10. (Note that the 0.2Q5 end of the range may be modified).

► **OPTION 2: LID INTEGRATED MANAGEMENT PRACTICES**

Low Impact Development Integrated Management Practices, such as bioretention facilities, planter boxes, and dry wells, can achieve the hydromodification standard. However, the Copermitees have not yet prepared design criteria and sizing factors for these facilities applicable to projects 50 acres or more. Project proponents for projects 50 acres or more may use Option 1 to demonstrate their IMPs meet the interim criteria.

► **OPTION 3: EXEMPTION FROM HYDROMODIFICATION MANAGEMENT**

Exemption from the IHC is allowed for development projects when any of the following conditions are met. (However, plans to restore a channel reach may re-introduce the applicability of hydromodification management.)

1. The project would discharge into channels that are concrete-lined or significantly hardened (e.g., with rip-rap, sackcrete, etc.) downstream to their outfall in bays or the ocean;
2. The project would discharge into underground storm drains discharging directly to bays or the ocean;
3. The project would discharge to a channel where the sub-watershed areas below the project's discharge points are highly impervious (e.g. >70%) and the potential for single-project and/or cumulative impacts is minimal; or

4. The applicant conducts an assessment incorporating sediment transport modeling across the range of geomorphically-significant flows that demonstrates project flows and sediment reductions will not detrimentally affect the receiving water. A May 15, 2008 memorandum, "Geomorphic Analysis for Interim Hydrograph Modification Plan" is available on the Project Clean Water website.

Grandfathering. Projects with prior lawful approval (such as a development agreement, vested tentative map, or a building or grading permit) that have started construction before March 25, 2008, may not have to meet the interim hydromodification management requirements. Verify with municipal staff.

Note these are interim requirements and will be superseded following approval of the HMP by the Regional Water Board sometime after mid-2009. Updated hydromodification criteria for all Priority Development Projects will be incorporated into local SUSMP requirements sometime in 2010 or later.

Waivers from Numeric Sizing Criteria

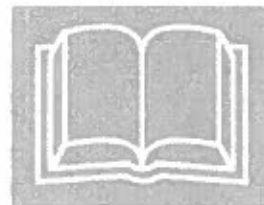
The NPDES permit allows for a project to be waived from numeric sizing criteria for stormwater treatment **only** if all available treatment facilities have been considered and found **infeasible**. Municipal staff must inform the Water Board within 5 days of granting a waiver. Other SUSMP requirements—including site designs to minimize imperviousness and source control BMPs—will still apply.

Experience has shown implementation of LID facilities, as described in Chapter 4, is feasible on nearly all development sites. However, the use of LID to retrofit existing drainage systems, to manage runoff from sites smaller than one acre in pedestrian-oriented developments, or to manage runoff from widened portions of roadways, sometimes presents special challenges. In these special situations, applicants should see the discussion of "Selection of Stormwater Treatment Facilities" in Chapter 2 and evaluate the options described on page 23 in order (depending on the specific characteristics of the project and as determined by local development review staff). All the options listed meet the numeric sizing criteria in the NPDES permit.

If infeasibility of all these options can be established, local development review staff may determine eligibility of the project for a waiver.

References and Resources:

- RWQCB Order R9-2007-0001 (Stormwater NPDES Permit)
- Project Clean Water web page



Concepts and Criteria

Technical background and explanations of policies and design requirements

The Regional Water Board reissued a municipal stormwater NPDES permit to San Diego County, its 18 cities, the San Diego Unified Port District, and the San Diego Regional Airport Authority in January 2007. The permit mandates a comprehensive program to prevent stormwater pollution. That program now includes street sweeping, maintenance of storm drains, business inspections, public outreach, construction site inspections, monitoring and studies of stream and ocean health, and control of runoff pollutants from new developments and redevelopments.

Permit Provision D.1.d. requires Copermitees to regulate projects in specific categories (Table 1-1) to:

1. Reduce discharges of pollutants to the maximum extent practicable.
2. Prevent runoff discharges from causing or contributing to a violation of water quality standards.

The Copermitees have created a Low Impact Development (LID) design procedure (Chapter 4) that ensures consistent and thorough implementation of the Regional Water Board's requirements. This chapter explains the technical background of the LID approach and how it was derived.

The previous permit, issued in 2001, included a requirement to control the post-development peak storm water runoff rates and velocities to maintain or reduce pre-development downstream erosion and protect stream habitat. The 2007 permit includes, in addition to this ongoing requirement, a new requirement to develop a hydromodification management plan (HMP) to identify and define a methodology and performance criteria to ensure flow rates and durations do not

exceed pre-project runoff where increased runoff could cause erosion or other significant adverse impacts to beneficial uses.

As required by the NPDES permit, the Copermittees have adopted interim hydromodification criteria. See Chapter One.

Water-Quality Regulations

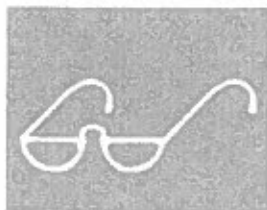
Provision D.1 requires the Copermittees to condition development approvals on incorporation of specified stormwater controls.

Provision D.1 requires applicable new developments and redevelopments:

- Design the site to conserve natural areas, existing trees and vegetation and soils, to maintain natural drainage patterns, to minimize imperviousness, to detain runoff, and to infiltrate runoff where feasible
- Cover or control sources of stormwater pollutants
- Treat runoff prior to discharge. Provision E.10 states: "Urban runoff treatment and/or mitigation must occur prior to the discharge of urban runoff into a receiving water. Federal regulations at 40 CFR 131.10(a) state that in no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the U.S."
- Ensure runoff does not exceed pre-project peaks and durations where increases could affect downstream habitat or other beneficial uses
- Maintain treatment and flow-control facilities

The municipalities each maintain a database to track approved installations of treatment facilities and to verify facilities are maintained. The Copermittees' annual report to the Regional Water Board includes a list of development projects subject to SUSMP conditions and descriptions of those projects that:

- Received a waiver from SUSMP criteria;
- Used hydrologic controls used to meet HMP requirements, including a description of the controls;



- Have an area of 50 acres or greater, thus subject to **Interim Hydromodification Criteria**; and

The Copermittees must also report the number of violations and enforcement actions taken upon development projects. The Copermittees' programs are subject to audit by the Regional Water Board.

The municipalities—not the Regional Water Board or its staff—are charged with ensuring development projects comply with the D.1 requirements. Regional Water Board staff sometimes review stormwater controls and hydromodification impacts in connection with applications for Clean Water Act Section 401 water-quality certification, which is required for projects that involve work, such as dredging or placement of fill, within streams, creeks, or other waters of the US.

► MAXIMUM EXTENT PRACTICABLE

Clean Water Act Section 402(p)(3)(iii) sets the standard for stormwater controls as “maximum extent practicable,” but doesn’t define that term. As implemented, “maximum extent practicable” is ever-changing and varies with conditions.

Many stormwater controls, including LID facilities, have proven to be practicable in most site development projects. To achieve fair and effective implementation, criteria and guidance, requirements for controls must be detailed and specific—while also offering the right amount of flexibility or exceptions for special cases. The NPDES permit includes various standards, including hydrologic criteria, which have been found to comprise “maximum extent practicable.” This model SUSMP is to be continuously improved and refined based on the experience of municipal planners and engineers, with input from land developers and development professionals. By following the model SUSMP, applicants can ensure their project design meets “maximum extent practicable.”

► BEST MANAGEMENT PRACTICES

Clean Water Act Section 402(p) and USEPA regulations (40 CFR 122.26) specify a municipal program of “management practices” to control stormwater pollutants. **Best Management Practice (BMP)** refers to any kind of procedure, activity or device designed to minimize the quantity of pollutants that enter the storm drain system. BMPs are typically used in place of assigning numeric effluent limits. The criteria for source control BMPs and treatment and flow-control facilities are crafted to fulfill “maximum extent practicable.”

To minimize confusion, this guidebook refers to “facilities,” “features,” or “controls” to be incorporated into development projects. All of these are BMPs.

Pollutants of Concern

NPDES Permit Provision D.1.d.(3) requires each Copermittee to develop and implement a procedure for pollutants of concern to be identified for each Priority Development Project. The Copermittees have considered this requirement jointly and have determined the LID design procedures in Chapters 3 and 4 of this model SUSMP fully address the need to identify pollutants of concern insofar as that identification may affect the selection of source control BMPs and treatment facilities.

Documentation of the approach to identifying pollutants of concern and selecting BMPs and facilities follows.

► GROUPING OF POTENTIAL POLLUTANTS OF CONCERN

Urban runoff from a developed site has the potential to contribute pollutants, including oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the storm water conveyance system and receiving waters. For the purposes of identifying pollutants of concern and associated storm water BMPs, pollutants are grouped in nine general categories as follows:

- **Sediments** are soils or other surficial materials eroded and then transported or deposited by the action of wind, water, ice, or gravity. Sediments can increase turbidity, clog fish gills, reduce spawning habitat, lower young aquatic organisms survival rates, smother bottom dwelling organisms, and suppress aquatic vegetation growth.
- **Nutrients** are inorganic substances, such as nitrogen and phosphorus. They commonly exist in the form of mineral salts that are either dissolved or suspended in water. Primary sources of nutrients in urban runoff are fertilizers and eroded soils. Excessive discharge of nutrients to water bodies and streams can cause excessive aquatic algae and plant growth. Such excessive production, referred to as cultural eutrophication, may lead to excessive decay of organic matter in the water body, loss of oxygen in the water, release of toxins in sediment, and the eventual death of aquatic organisms.
- **Metals** are raw material components in non-metal products such as fuels, adhesives, paints, and other coatings. Primary sources of metal pollution in storm water are typically commercially available metals and metal products. Metals of concern include cadmium, chromium, copper, lead, mercury, and zinc. Lead and chromium have been used as corrosion inhibitors in primer coatings and cooling tower systems. At low concentrations naturally occurring in soil, metals are not toxic. However, at higher concentrations, certain metals can be toxic to aquatic life. Humans can be impacted from contaminated groundwater

resources, and bioaccumulation of metals in fish and shellfish. Environmental concerns, regarding the potential for release of metals to the environment, have already led to restricted metal usage in certain applications.

- **Organic compounds** are carbon-based. Commercially available or naturally occurring organic compounds are found in pesticides, solvents, and hydrocarbons. Organic compounds can, at certain concentrations, indirectly or directly constitute a hazard to life or health. When rinsing off objects, toxic levels of solvents and cleaning compounds can be discharged to storm drains. Dirt, grease, and grime retained in the cleaning fluid or rinse water may also adsorb levels of organic compounds that are harmful or hazardous to aquatic life.
- **Trash** (such as paper, plastic, polystyrene packing foam, and aluminum materials) and biodegradable organic matter (such as leaves, grass cuttings, and food waste) are general waste products on the landscape. The presence of trash & debris may have a significant impact on the recreational value of a water body and aquatic habitat. Excess organic matter can create a high biochemical oxygen demand in a stream and thereby lower its water quality. Also, in areas where stagnant water exists, the presence of excess organic matter can promote septic conditions resulting in the growth of undesirable organisms and the release of odorous and hazardous compounds such as hydrogen sulfide.
- **Oxygen-Demanding Substances** includes biodegradable organic material as well as chemicals that react with dissolved oxygen in water to form other compounds. Proteins, carbohydrates, and fats are examples of biodegradable organic compounds. Compounds such as ammonia and hydrogen sulfide are examples of oxygen-demanding compounds. The oxygen demand of a substance can lead to depletion of dissolved oxygen in a water body and possibly the development of septic conditions.
- Primary sources of **oil and grease** are petroleum hydrocarbon products, motor products from leaking vehicles, esters, oils, fats, waxes, and high molecular-weight fatty acids. Introduction of these pollutants to the water bodies are very possible due to the wide uses and applications of some of these products in municipal, residential, commercial, industrial, and construction areas. Elevated oil and grease content can decrease the aesthetic value of the water body, as well as the water quality.

- **Bacteria and Viruses** are ubiquitous microorganisms that thrive under certain environmental conditions. Their proliferation is typically caused by the transport of animal or human fecal wastes from the watershed. Water, containing excessive bacteria and viruses can alter the aquatic habitat and create a harmful environment for humans and aquatic life. Also, the decomposition of excess organic waste causes increased growth of undesirable organisms in the water.
- **Pesticides** (including herbicides) are chemical compounds commonly used to control nuisance growth or prevalence of organisms. Excessive application of a pesticide may result in runoff containing toxic levels of its active component.

► **IDENTIFYING POLLUTANTS OF CONCERN BASED ON LAND USES**

Table 2-1 associates pollutants with the categories of Priority Development Projects. Pollutants associated with any hazardous material sites that have been remediated or are not threatened by the proposed project are not considered a pollutant of concern.

► **WATERSHEDS WITH SPECIAL POLLUTANT CONCERNS**

Local receiving water conditions may require specialized attention. The three local conditions to consider include:

- Ocean waters designated as an "Area of Special Biological Significance" (ASBS)
- 303(d) listed waters; and
- Waters with established TMDLs.

TABLE 2-1. ANTICIPATED AND POTENTIAL Pollutants Generated by Land Use Type.

Priority Project Categories	General Pollutant Categories								
	Sediment	Nutrients	Heavy Metals	Organic Compounds	Trash & Debris	Oxygen Demanding Substances	Oil & Grease	Bacteria & Viruses	Pesticides
Detached Residential Development	X	X			X	X	X	X	X
Attached Residential Development	X	X			X	P(1)	P(2)	P	X
Commercial Development >one acre	P(1)	P(1)	X	P(2)	X	P(5)	X	P(3)	P(5)
Heavy Industry	X		X	X	X	X	X		
Automotive Repair Shops			X	X(4)(5)	X		X		
Restaurants					X	X	X	X	P(1)
Hillside Development >5,000 ft ²	X	X			X	X	X		X
Parking Lots	P(1)	P(1)	X		X	P(1)	X		P(1)
Retail Gasoline Outlets			X	X	X	X	X		
Streets, Highways & Freeways	X	P(1)	X	X(4)	X	P(5)	X	X	P(1)
X = anticipated P = potential (1) A potential pollutant if landscaping exists on-site. (2) A potential pollutant if the project includes uncovered parking areas. (3) A potential pollutant if land use involves food or animal waste products. (4) Including petroleum hydrocarbons. (5) Including solvents.									

The State Water Resources Control Board's California Ocean Plan identifies thirty-four locations along the California coast as **Areas of Special Biological Significance (ASBS)**. The Ocean Plan prohibits the discharge of wastes into these locations, thus barring discharges associated with industrial activities,

publicly owned treatment works, and other traditional point discharges. In 2004 the SWRCB informed affected municipal stormwater programs throughout the state that urban runoff contained a waste and was subject to the prohibition. In March 2008, the SWRCB released a draft *Special Protections for Selected Storm Water and Nonpoint Source Discharges into Areas of Special Biological Significance* that defines design criteria for treating stormwater discharges and elimination of dry-weather discharges associated with non-stormwater sources. San Diego County contains two ASBS locations, the La Jolla ASBS and the San Diego-Scripps ASBS. These locations are adjacent and extend from the northern bluffs of La Jolla through the UC San Diego campus of the Scripps Institute of Oceanography. Proposed development in the watershed of an ASBS may be prohibited; however, the project proponent should immediately contact the municipality for further guidance in contending with ASBS prohibitions.

The NPDES Permit identifies several receiving waters as impaired for constituents or water quality effects pursuant to **Section 303(d)** of the Clean Water Act. Placement of a water onto the list requires the Regional Board to make further analysis of the impairment and development of total maximum daily loads (TMDLs) for addressing the impairment. The 303(d) listing in itself does not demand that a project proponent select BMPs on the basis of the impairment; however, the project proponent should be cognizant of the impairment and the future implications a TMDL might have upon the proposed land use.

Once a TMDL is established it may impose conditions on development either through an implementation plan and schedule for the listed water, or through special conditions required of the municipality affected by the numeric criteria of the TMDL. At this time, several 303(d) listings in San Diego County are at various stages of TMDL development with only four TMDLs having been adopted by the Regional Board. However, there are approximately 190 pending TMDLs in the county.

The **adopted TMDLs** in the San Diego area include:

- Diazinon for Chollas Creek;
- Nitrogen and phosphorous for Rainbow Creek;
- Dissolved copper for Shelter Island Yacht Basin;
- Copper, lead, and zinc for Chollas Creek, and
- Indicator bacteria for beaches and creeks in the San Diego Region.

The applicant should meet with municipal staff to determine if any project characteristics or watershed characteristics affect selection and design of BMPs. Except in rare circumstances, the use of the LID Design Guide (Chapter 4) and

the Stormwater Pollutant Sources/Source Control Checklist (Appendix) will ensure your project complies with all stormwater requirements.

Selection of Permanent Source Control BMPs

Based on identification of potential pollutants of concern associated with various types of facilities, the Co-permittees have developed a Stormwater Pollutant Sources/Source Control Checklist (Appendix) of "maximum extent practicable" source controls associated with each facility type. This approach ensures appropriate BMPs are applied to potential sources of each pollutant of concern.

Selection of Stormwater Treatment Facilities

The model SUSMP updated in early 2008 groups pollutants of concern by how easily they are removed by various treatment processes (Table 2-2).

The same document also includes a general comparison of how various types of treatment facilities perform for each group of pollutants (Table 2-3).

TABLE 2-2. GROUPING OF POTENTIAL POLLUTANTS of Concern by fate during stormwater treatment

Pollutant	Coarse Sediment and Trash	Pollutants that tend to associate with fine particles during treatment	Pollutants that tend to be dissolved following treatment
Sediment	X	X	
Nutrients		X	X
Heavy Metals		X	
Organic Compounds		X	
Trash & Debris	X		
Oxygen Demanding		X	
Bacteria		X	
Oil & Grease		X	
Pesticides		X	

TABLE 2-3. GROUPS OF POLLUTANTS and relative effectiveness of treatment facilities

Pollutants of Concern	Bioretention Facilities (LID)	Settling Basins (Dry Ponds)	Wet Ponds and Constructed Wetlands	Infiltration Facilities or Practices (LID)	Media Filters	Higher-rate biofilters*	Higher-rate media filters*	Trash Racks & Hydro-dynamic Devices
Coarse Sediment and Trash	High	High	High	High	High	High	High	High
Pollutants that tend to associate with fine particles during treatment	High	High	High	High	High	Medium	Medium	Low
Pollutants that tend to be dissolved following treatment	Medium	Low	Medium	High	Low	Low	Low	Low

*See page 23 for a discussion of selection of treatment facilities in special situations.

Based on this analysis, the Copermittees have determined that the following types of facilities are appropriate for treatment of runoff potentially containing most pollutants of concern. These types of facilities can be used for stormwater treatment for all land uses in all watersheds, except where site-specific constraints make them infeasible.

- Infiltration facilities or practices, including dry wells, infiltration trenches, infiltration basins, and other facilities that infiltrate runoff to native soils (sized to detain and infiltrate a volume equivalent to the 85th percentile 24-hour event).
- Bioretention facilities and media filters that detain stormwater and filter it slowly through soil or sand (sized with a surface area at least 0.04 times the effectively impervious tributary area).
- Extended detention basins, wet ponds, and wetlands or other facilities using settling (sized to detain a volume equivalent to runoff from the tributary area generated by the 85th percentile 24-hour event).

The recommended design procedure in Chapter 4 integrates LID practices—optimizing the site design, using pervious surfaces, and dispersing of runoff to adjacent pervious areas—with the use of infiltration facilities and practices and bioretention facilities to meet NPDES permit LID requirements, treatment requirements, and flow-control requirements in a cost-effective, unified design.

Oil/water separators (“water quality inlets”), storm drain inlet filters, and hydrodynamic separators, including vortex separators and continuous deflection separators (“CDS units”), are less effective means of stormwater treatment, although they may be used in series with more effective facilities.

Underground vaults typically lack the detention time required for settling of fine particles associated with stormwater pollutants. They also require frequent maintenance and may retain stagnant water, potentially providing harborage for mosquitoes. Because vaults may be “out of sight, out of mind,” experience shows that the required maintenance may not occur.

Lack of space, in itself, is not a suitable justification for using a less-effective treatment on a development site, because the uses of the site and the site design can be altered as needed to accommodate bioretention facilities or planter boxes. In most cases, these effective facilities can be fit into required landscaping setbacks, easements, or other unbuildable areas.

Where possible, drainage to inlets, and drainage away from overflows and underdrains, should be by gravity. Where site topography makes it infeasible to accommodate gravity-fed facilities in the project design, the design flow may be captured in a vault or sump and pumped via force main to an effective facility.

The following situations sometimes present special challenges:

- Portions of sites which are not being developed or redeveloped, but which must be retrofit to meet treatment requirements in accordance with Provision D.1.d.(1)(a) which states in part: “Where redevelopment results in an increase of, or replacement of, more than fifty percent of the impervious surface of a previously existing development, the numeric sizing criteria applies to the entire development.”
- Sites smaller than one acre approved for development or redevelopment as part of a municipality’s stated objective to preserve or enhance a pedestrian-oriented “smart-growth” type of urban design. Municipalities are encouraged to identify areas where this objective applies, based on General Plans or zoning.
- Roadway widening projects.

In these special situations, the following types of facilities should each be evaluated in priority order (depending on the specific characteristics of the site and as determined by the municipal stormwater coordinator) until a feasible design is found.

1. Bioretention areas or planter boxes fed by gravity.
2. Capture of the design flow in a vault or sump and pumping to bioretention areas or planter boxes.
3. A subsurface sand or media filter with a maximum design surface loading rate of 5 inches per hour and a minimum media depth of 18

inches. The sand surface must be made accessible for periodic inspection and maintenance (for example, via a removable grating).

4. A higher-rate surface biofilter, such as a tree-pit-style unit. The grading and drainage design should minimize the area draining to each unit and maximize the number of discrete drainage areas and units.
5. A higher-rate vault-based filtration unit (for example, vaults with replaceable cartridge filters filled with inorganic media).

Many proprietary stormwater treatment devices are currently marketed, and new brands will be introduced. Applicants and applicants' engineers and design professionals should review with municipal staff any proposals for using proprietary devices for stormwater treatment before they commence work on preliminary site layout, drainage plans, grading plans, or landscape plans.

Proprietary Devices

Many currently available proprietary devices do not meet municipalities' requirements when used alone for stormwater treatment. Consult with municipal staff before proposing these devices.

Hydrology for NPDES Compliance

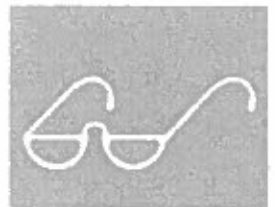
► IMPERVIOUSNESS

Schueler (1995) proposed **Imperviousness** as a "unifying theme" for the efforts of planners, engineers, landscape architects, scientists, and local officials concerned with urban watershed protection. Schueler argued (1) that imperviousness is a useful indicator linking urban land development to the degradation of aquatic ecosystems, and (2) imperviousness can be quantified, managed, and controlled during land development.

Imperviousness has long been understood as the key variable in urban hydrology. Peak runoff flow and total runoff volume from small urban catchments is usually calculated as a function of the ratio of impervious area to total area (**rational method**). The ratio correlates to the runoff factor, usually designated "C". Increased flows resulting from urban development tend to increase the frequency of small-scale flooding downstream.

Imperviousness links urban land development to degradation of aquatic ecosystems in two ways.

First, the combination of paved surfaces and piped runoff efficiently collects urban pollutants and transports them, in suspended or dissolved form, to surface waters. These pollutants may originate as airborne dust, be washed from the atmosphere during rains, or may be generated by automobiles and outdoor work activities.



Second, increased peak flows and runoff durations typically cause erosion of stream banks and beds, transport of fine sediments, and disruption of aquatic habitat. Measures taken to control stream erosion, such as hardening banks with riprap or concrete, may permanently eliminate habitat. By reducing infiltration to groundwater, imperviousness may also reduce dry-weather stream flows.

Imperviousness has two major components: rooftops and transportation (including streets, highways, and parking areas). The transportation component is usually larger and is more likely to be **directly connected** to the storm drain system.

The effects of imperviousness can be mitigated by disconnecting impervious areas from the drainage system and by encouraging detention and retention of runoff near the point where it is generated. Detention and retention reduce peak flows and volumes and allow pollutants to settle out or adhere to soils before they can be transported downstream.

► LOW IMPACT DEVELOPMENT REQUIREMENTS

The NPDES permit requires LID be used on all projects to minimize directly connected impervious area and promote infiltration. For Priority Development Projects, the minimum standards are:

- Drain a portion of impervious areas into pervious areas, if any.
- Design and construct pervious areas, if any, to effectively receive and infiltrate runoff from impervious areas, taking into account soil conditions, slope, and other pertinent factors.
- Construct a portion of paved areas with low traffic and appropriate soil conditions with permeable surfaces.

The LID design procedure in Chapter 4 incorporates these requirements into an integrated design which also meets sizing requirements for stormwater treatment facilities and flow-control (hydromodification management) requirements.

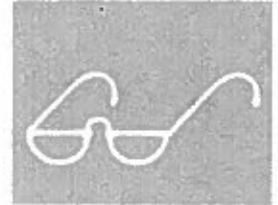
► SIZING REQUIREMENTS FOR STORMWATER TREATMENT FACILITIES

The guidance in Chapter 4 was crafted to ensure LID facilities comply with the NPDES permit's hydraulic sizing requirements for stormwater treatment facilities and flow-control facilities. The technical background follows.

Most runoff is produced by frequent storms of small or moderate intensity and duration. Treatment facilities are designed to treat smaller storms and the first flush of larger storms—approximately 80% of average annual runoff.

The NPDES permit identifies two types of treatment facilities—volume-based and flow-based.

Volume-based facilities must be designed to infiltrate, filter, or treat the volume of runoff produced from a 24-hour 85th percentile storm event as determined from the County of San Diego's 85th Percentile Precipitation Isopluvial Map. As shown on the map, rainfall depths vary from about 0.55" to 1.55".



For **flow-based** facilities, the NPDES permit specifies the rational method be used to determine flow. The rational method uses the equation

$Q = CiA$, where

Q = flow

C = weighted runoff factor between 0 and 1

i = rainfall intensity

A = area

The permit identifies two alternatives for calculating rainfall intensity:

1. the 85th percentile rainfall intensity times two, or
2. 0.2 inches per hour.

It is typically found that both methods yield similar results. The 0.2 inches per hour rainfall intensity should be used for sizing flow-based treatment facilities within the Copermittees' jurisdiction.

The 0.2 inches per hour criterion is the basis for a **consistent countywide sizing factor** for bioretention facilities when used for stormwater treatment only (i.e., not for flow control). The factor is based on maintaining a minimum percolation rate of 5 inches per hour through the engineered soil mix. The sizing factor is the ratio of the design intensity of rainfall on tributary impervious surfaces (0.2 inches/hour) to the design percolation rate in the facility (5 inches/hour), or **0.04** (dimensionless).

► FLOW-CONTROL (HYDROMODIFICATION MANAGEMENT)

The NPDES permit specifies for applicable projects:

... post-project runoff flow rates and durations shall not exceed pre-project runoff flow rates and durations where the increased discharge

flow rates and durations will result in increased potential for erosion or other significant adverse impacts to beneficial uses, attributable to changes in flow rates and durations.

Under current Interim Hydromodification Criteria, the requirement applies to projects disturbing 50 acres or more, and applicants may select among **three options** for compliance: Use a continuous simulation model to compare pre-project and post-project runoff, use LID facilities with sizing factors and design criteria developed by the Co-permittees, or identify a specified exemption. See Chapter One.

The technical background for the Interim Hydromodification Criteria is in the memorandum "Development of Interim Hydromodification Criteria" (October 30, 2007) and other technical documents available on the Project Clean Water website.

Criteria for Infiltration Devices

The NPDES permit restricts the design and location of "infiltration devices" that, as designed, may bypass filtration through surface soils before reaching groundwater. These devices include:

- Infiltration basins.
- Infiltration trenches (includes french drains).
- Unlined retention basins (i.e., basins with no outlets).
- Unlined or open-bottomed vaults or boxes installed below grade (dry wells).

Infiltration devices may not be used in:

- Areas of industrial or light industrial activity; areas subject to high vehicular traffic (25,000 or greater average daily traffic on main roadway or 15,000 or more average daily traffic on any intersecting roadway);
- Automotive repair shops;
- Car washes;
- Fleet storage areas (bus, truck, etc.);

COUNTYWIDE MODEL SUSMP

- Nurseries;
- Other areas with pollutant sources that could pose a threat to groundwater, as designated by each Permittee.

The vertical distance from the base of any infiltration device to the seasonal high groundwater mark shall be at least 10 feet. Infiltration devices shall be located a minimum of 100 feet horizontally from any known water supply wells.

In addition, infiltration devices are not recommended where:

- The infiltration device would receive drainage from areas where chemicals are used or stored, where vehicles or equipment are washed, or where refuse or wastes are handled.
- Surface soils or groundwater are polluted.
- The facility could receive sediment-laden runoff from disturbed areas or unstable slopes.
- Increased soil moisture could affect the stability of slopes of foundations.
- Soils are insufficiently permeable to allow the device to drain within 72 hours.

► MOST LID FEATURES AND FACILITIES ARE NOT INFILTRATION DEVICES

Self-treating and self-retaining areas, pervious pavements, bioretention facilities, and planter boxes are not considered to be infiltration devices.

Bioretention facilities work by percolating runoff through 18 inches or more of engineered soil. This removes most pollutants before the runoff is allowed to seep into native soils below. Further pollutant removal typically occurs in the unsaturated (vadose) zone before moisture reaches groundwater.

Where there is concern about the effects of increased soil moisture on slopes or foundations, an impermeable barrier may be added so the facility is “flow through” and all treated runoff is underdrained away from the facility. See the design sheets for Bioretention Facilities and Flow-Through Planters in Chapter 4.

Environmental and Economic Benefit Perspective

The San Diego Region has varied topography consisting of coastal plain, central mountain-valley, and eastern mountain valley areas. Elevations range from sea level at the Pacific Ocean to approximately 6,000 feet at the summit of Palomar

Mountain. Temperature averages about 65 degrees Fahrenheit and average annual precipitation is between 10 and 13 inches.

San Diego County comprises 10 major stream systems: San Onofre Creek, Santa Margarita River, San Luis Rey River, San Marcos Creek, Escondido Creek, San Dieguito River, San Diego River, Sweetwater River, Otay River, and the Tijuana River. Almost all stream systems in the San Diego region have both perennial and ephemeral reaches. In addition, most of these streams have been impacted by impoundments and/or channelization. There are few undisturbed stream reaches left in San Diego County.

San Diego County is approximately 2.7 million acres and roughly 1.8 million acres (66 percent) is developed or in use. Much of the remaining land is preserved from future development.

Impervious surfaces now cover much of the land, and storm drains pipe runoff from urban areas directly into streams. As in many of California's urban areas, growth and development have caused changes in the timing and intensity of stream flows. These changes can then lead to more frequent flooding, destabilized stream banks, armoring of streambanks with riprap and concrete, loss of streamside trees and vegetation, and the destruction of stream habitat.

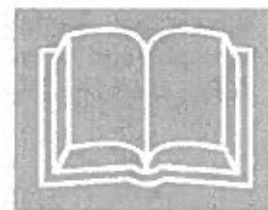
The remaining habitat in the region is composed of sensitive coastal sage scrub, chaparral, woodlands, and grasslands. Human encroachment and habitat loss threaten close to 300 species of plants and animals in California. Many of those reside in southern California and range from native grasslands to the Fairy Shrimp.

Once altered, natural streams and their ecosystems cannot be fully restored. However, **it is possible to stop, and partially reverse, the trend of declining habitat** and preserve some ecosystem values for the benefit of future generations.

This is an enormous, long-term effort. Managing runoff from a single development site may seem inconsequential, but by changing the way most sites are developed (and redeveloped), we may be able to preserve and enhance existing stream ecosystems in urban and urbanizing areas.

References and Resources:

- RWQCB Order R9-2007-0001 (Stormwater NPDES Permit)
- County of San Diego Low Impact Development Handbook
- Clean Water Act Section 402(p)
- 40 CFR 122.26
- San Diego Regional Water Quality Control Board—TMDLs
- State Water Resources Control Board—Ocean Standards
- Site Planning for Urban Stream Protection (Scheuler, 1995).
- "Application of Water-Quality Engineering Fundamentals to the Assessment of Stormwater Treatment Devices" (Salvia, 2000).







Preparing Your Project Submittal

Step-by-step assistance to demonstrate compliance.

Your Project Submittal will demonstrate your project complies with all applicable requirements in the stormwater NPDES permit—to minimize imperviousness, retain or detain stormwater, slow runoff rates, incorporate required source controls, treat stormwater prior to discharge, control runoff rates and durations, and provide for operation and maintenance of treatment and flow-control facilities.

ICON KEY

-  Helpful Tip
-  Submittal Requirement
-  Terms to Look Up
-  References & Resources

Submittal requirements vary from jurisdiction to jurisdiction. Obtain the specific requirements from local staff.

Typically, your Project Submittal must be coordinated with your application for discretionary approvals and must have sufficient detail to ensure the stormwater design, site plan, and landscaping plan are congruent.

A complete and thorough Project Submittal will facilitate quicker review and fewer cycles of review. Every municipality in San Diego County requires a submittal for every applicable project.

Be sure to obtain specific submittal requirements from the jurisdiction in which your project is located. Your Project Submittal may consist of a report and an exhibit. **Municipal staff may use a checklist** such as the following example to evaluate your Project Submittal:



EXAMPLE PROJECT SUBMITTAL CHECKLIST

CONTENTS OF EXHIBIT

Show all of the following on drawings:

- ☐ Existing natural hydrologic features (depressions, watercourses, floodplains, relatively undisturbed areas) and significant natural resources. (Step 1 in the following step-by-step instructions)
- ☐ Soil types and depth to groundwater. (Step 1)
- ☐ Existing and proposed site drainage network and connections to drainage off-site. (Step 3)
- ☐ Proposed design features and surface treatments used to minimize imperviousness. (Step 3)
- ☐ Entire site divided into separate drainage areas, with each area identified as self-treating, self-retaining (zero-discharge), draining to a self-retaining area, or draining to an IMP. (Step 3)
- ☐ For each drainage area, types of impervious area proposed (roof, plaza/sidewalk, and streets/parking) and area of each. (Step 3)
- ☐ Proposed locations and sizes of treatment or flow-control facilities. (Step 3)
- ☐ Potential pollutant source areas, including refuse areas, outdoor work and storage areas, etc. listed in the Appendix and corresponding required source controls. (Step 4)

CONTENTS OF REPORT

Include all of the following in a report:

- ☐ Narrative analysis or description of site features and conditions that constrain, or provide opportunities for, stormwater control. (Step 2)
- ☐ Narrative description of site design characteristics that protect natural resources. (Step 3)
- ☐ Narrative description and/or tabulation of site design characteristics, building features, and pavement selections that reduce imperviousness of the site. (Step 3)
- ☐ Tabulation of proposed pervious and impervious area, showing self-treating areas, self-retaining areas, and areas tributary to each treatment or flow-control facility. (Step 3)
- ☐ Preliminary designs, including calculations, for each infiltration, treatment, or flow-control facility. Elevations should show sufficient hydraulic head for each. (Step 3)
- ☐ A table of identified pollutant sources and for each source, the source control measure(s) used to reduce pollutants to the maximum extent practicable. See worksheet in the Appendix. (Step 4)
- ☐ General maintenance requirements for infiltration, treatment, and flow-control facilities (Step 5)
- ☐ Means by which facility maintenance will be financed and implemented in perpetuity. (Step 5)
- ☐ Statement accepting responsibility for interim operation & maintenance of facilities (Step 5).
- ☐ Identification of any conflicts with codes or requirements or other anticipated obstacles to implementing the proposed facilities in the submittal (Step 6).
- ☐ Construction Plan SUSMP Checklist (Step 6).
- ☐ Certification by a civil engineer, architect, and landscape architect (Step 6).

Step by Step

Suggested coordination with site and landscape design

Plan and design your stormwater controls integrally with the site planning and landscaping for your project. It's best to start with general project requirements and preliminary site design concepts; then prepare the detailed site design, landscape design, and stormwater control design simultaneously. **This will help ensure that your site plan, landscape plan, and Project S ubmittal are congruent.**

Begin with general project requirements and program.

The following step-by-step procedure should optimize your design by identifying the best opportunities for stormwater controls **early in the design process.**

The recommended steps are:

Sketch conceptual site layout, building locations, and circulation.

1. Assemble needed information.
2. Identify site opportunities and constraints.
3. Follow the LID design guidance in Chapter 4 to analyze your project for LID and to develop and document your drainage design.

Revise site layout, building locations, and circulation to accommodate LID design. Develop landscaping plan.

4. Specify source controls using the sources/source control checklist in the Appendix.
5. Plan for ongoing maintenance of treatment and flow-control facilities.
6. Complete the Project Submittal.

Submit Site Plan, Landscape Plan, and SUSMP Submittal

Municipal staff may recommend you prepare and submit a preliminary site design prior to formally applying for planning and zoning approvals. Your preliminary site design should incorporate a conceptual plan for site drainage, including self-treating and self-retaining areas and the location and approximate sizes of any treatment facilities. This additional up-front design effort will save time and avoid potential delays later in the review process.

Step 1: Assemble Needed Information

To select types and locations of treatment facilities, the designer needs to know the following site characteristics:

- **Existing natural hydrologic features** and natural resources, including any contiguous natural areas, wetlands, watercourses, seeps, or springs.

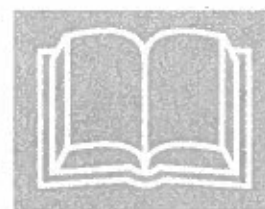
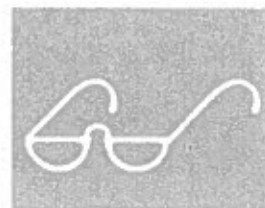
- **Existing site topography**, including contours of any slopes of 4% or steeper, general direction of surface drainage, local high or low points or depressions, any outcrops or other significant geologic features.
- **Zoning**, including requirements for **setbacks** and **open space**.
- **Public Works Standards** or other local codes governing minimum street widths, sidewalk construction, allowable pavement types, and drainage. These codes may conflict with Low Impact Development objectives to minimize imperviousness and to maintain or restore natural site hydrology. Municipalities are encouraged to review and revise codes to resolve these conflicts where it is possible to do so.
- Soil types (including **hydrologic s oil gr oups**) and depth to groundwater, which may determine whether infiltration is a feasible option for managing site runoff. Depending on site location and characteristics, and on the selection of treatment and flow-control facilities, site-specific information (e.g. from boring logs or geotechnical studies) may be required.
- **Existing site drainage**. For undeveloped sites, this should be obtained by inspecting the site and examining topographic maps and survey data. For previously developed sites, site drainage and connection to the municipal storm drain system can be located from site inspection, municipal storm drain maps, and plans for previous development.
- Existing **vegetative cover** and **impervious areas**, if any.

References and Resources

- *Site Planning for Urban Stream Protection* (Scheuler 1995).
- *Start at the Source* (BASMAA 1999), p. 36

Step 2: Identify Constraints & Opportunities

Review the information collected in Step 1. Identify the principal constraints on site design and selection of treatment and flow-control facilities as well as opportunities to reduce imperviousness and incorporate facilities into the site and landscape design. For example, **constraints** might include impermeable soils, high groundwater, groundwater pollution or contaminated soils, steep slopes, geotechnical instability, high-intensity land use, heavy pedestrian or vehicular traffic, restricted right-of-way, or safety concerns. **Opportunities** might include existing natural areas, low areas, oddly configured or otherwise unbuildable parcels, easements and landscape amenities including open space and buffers (which can double as locations for bioretention facilities), and differences in





elevation (which can provide hydraulic head). Note stormwater treatment facilities should not be located within protected riparian areas.

- If required by your municipality, prepare a brief **narrative** describing site opportunities and constraints. This narrative will help you as you proceed with LID design and explain your design decisions to others.

Step 3: Prepare and Document Your LID Design



Use the Low Impact Development Design Guide (Chapter 4) to analyze your project for LID, design and document drainage, and specify preliminary design details for integrated management practices. **Follow the detailed instructions in Chapter 4 to ensure your project complies with NPDES permit LID requirements (Provision D.1.d.(4)) as well as stormwater treatment requirements in Provision D.1.d.(6)).** In future editions of this model SUSMP, the LID Design Guide will be updated so that additional hydromodification management requirements are also met via this unified design procedure. Chapter 4 includes calculation procedures and formats for presenting your calculations.

As shown in the example checklist (page 32), your Project Submittal may need to include a drawing showing:

- The entire site divided into separate drainage management areas (DMAs), with each area identified as one of the following: self-treating, self-retaining, draining to a self-retaining area, or draining to an IMP. Each area should be clearly marked with a unique identifier.
- For each drainage area, the types of impervious area proposed, and the area of each.
- Proposed locations and sizes of treatment facilities. Each facility should be clearly marked with a unique identifier.

Compliance

The design criteria for DMAs in Chapter 4 ensure the required volume of flow from all developed portions of the project, including landscaped areas, is infiltrated, filtered, or treated (Provision D.1.d.(6)(a)).

Your Project Submittal may need to include:

- Tabulation of proposed self-treating areas, self-retaining areas, areas draining to self-retaining areas, and areas draining to IMPs, and the corresponding IMPs identified on the Exhibit.
- Calculations, in the format shown in Chapter 4, showing the minimum square footage required and proposed square footage for each IMP.

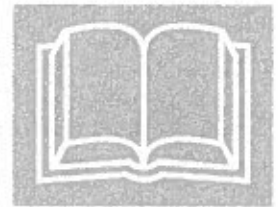
- Preliminary designs for each IMP. The design sheets and accompanying drawings in Chapter 4 may be used or adapted for this purpose.

The following may also be required, or may be advisable to assist the reviewer to understand your design:

- A narrative overview of your design and how your design decisions optimize the site layout, use pervious surfaces, disperse runoff from impervious surfaces, and drain impervious surfaces to engineered IMPs. See Chapter 4.
- A narrative briefly describing each **drainage management area** (DMA), its drainage, and where drainage will be directed.
- A narrative briefly describing each IMP. Include any special characteristics or features distinct from the design sheets in Chapter 4.

References and Resources

- Chapter 4
- *County of San Diego Low Impact Development Handbook*
- Your municipality's *General Plan*
- Your municipality's Zoning Ordinance and Development Codes
- *Low Impact Development Manual* (Prince George's County, Maryland, 1999).
- *Bioretention Manual* (Prince George's County, Maryland, rev. 2002)
- *Site Planning for Urban Stream Protection* (Schueler, 1995b).
- *Low Impact Development Technical Guidance Manual for Puget Sound* (Puget Sound Action Team, 2005)
- *LID for Big Box Retailers* (Low Impact Development Center, 2006)



Step 4. Specify Source Control BMPs

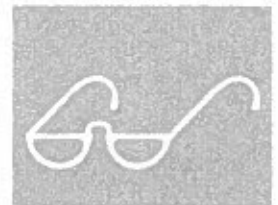
Some everyday activities – such as trash recycling/disposal and washing vehicles and equipment – generate pollutants that tend to find their way into storm drains. These pollutants can be minimized by applying **source control BMPs**.

Source control BMPs include **permanent**, structural features that must be incorporated into your project plans and **operational** BMPs, such as regular sweeping and “housekeeping,” that must be implemented by the site’s occupant or user. The maximum extent practicable standard typically requires both types of BMPs. In general, operational BMPs cannot be substituted for a feasible and effective permanent BMP.

Use the following procedure to specify source control BMPs for your site:

► IDENTIFY POLLUTANT SOURCES

Review the first column in the **Pollutant Sources/Source Control Checklist** (Appendix). Check off the potential sources of pollutants that apply to your site.



► **NOTE LOCATIONS ON SUBMITTAL DRAWING**

Note the corresponding requirements listed in Column 2 of the Pollutant Sources/Source Control Checklist (Appendix). Show the location of each pollutant source and each permanent source control BMP in your submittal drawing.



► **PREPARE A TABLE AND NARRATIVE**

Check off the corresponding requirements listed in Column 3 in the Pollutant Sources/Source Control Checklist (Appendix). Now, create a table using the format in Table 3-1. In the left column, list each potential source on your site (from Appendix, Column 1). In the middle column, list the corresponding **permanent, structural BMPs** (from Columns 2 and 3, Appendix) used to prevent pollutants from entering runoff. Accompany this table with a narrative that explains any special features, materials, or methods of construction that will be

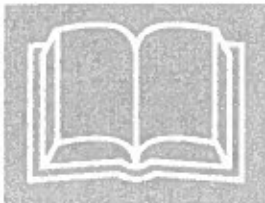
TABLE 3-1. Format for table of permanent and operational source control measures.

<i>Potential source of runoff pollutants</i>	<i>Permanent source control BMPs</i>	<i>Operational source control BMPs</i>

used to implement these permanent, structural BMPs.

► **IDENTIFY OPERATIONAL SOURCE CONTROL BMPs**

To complete your table, refer once again to the Pollutant Sources/Source Control Checklist (Appendix, Column 4). List in the right column of your table the operational BMPs that should be implemented as long as the anticipated activities continue at the site. The same BMPs may also be required as a condition of a use permit or other revocable discretionary approval for use of the site.



References and Resources

- Appendix: Stormwater Pollutant Sources/Source Control Checklist
- RWQCB Order R9-2007-0001, Provision D.1.d.(5)
- Start at the Source, Section 6.7: Details, Outdoor Work Areas
- California Stormwater Industrial/Commercial Best Management Practice Handbook
- Urban Runoff Quality Management (WEF/ASCE, 1998) Chapter 4: Source Controls

Step 5: Stormwater Facility Maintenance

As required by NPDES Permit Provision D.1.c.(5), your local municipality will require submittal of proof of a mechanism under which ongoing long-term maintenance of stormwater treatment and flow-control facilities will be conducted. Your municipality may require one of more of the following items be included in your Project Submittal:

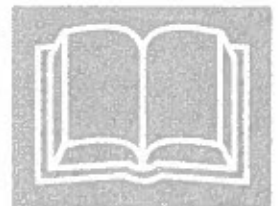
1. A means to finance and implement facility maintenance in perpetuity.
2. Acceptance of responsibility for maintenance from the time the facilities are constructed until responsibility for operation and maintenance is legally transferred. A warranty covering a period following construction may also be required.
3. An outline of general maintenance requirements for the treatment and flow-control facilities you have selected.

Your local municipality may also require that you prepare and submit a detailed plan that sets forth a maintenance schedule for each of the treatment and flow-control facilities built on your site.

Details of these requirements, and instructions for preparing a detailed operation and maintenance plan, are in Chapter 5.

References and Resources

- Chapter 5
- Operation, Maintenance, and Management of Stormwater Management Systems (Watershed Management Institute, 1997)



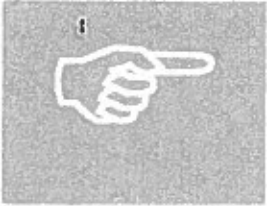
Step 6: Complete Your Project Submittal

Local municipal staff will provide specific instructions for the content and format of your Project Submittal. Your Project Submittal should document the information gathered and decisions made in Steps 1-5. A clear, complete, well-organized Project Submittal will make it possible to confirm your design meets the minimum requirements of the NPDES permit, the municipal stormwater pollution prevention ordinance, and this *SUSMP*.



► **COORDINATION WITH SITE, ARCHITECTURAL, AND LANDSCAPING PLANS**

Before completing your Project Submittal, ensure your stormwater control design is fully coordinated with the site plan, grading plan, and landscaping plan being proposed for the site.



Information submitted and presentations to design review committees, planning commissions, and other decision-making bodies must incorporate relevant aspects of the stormwater design. In particular, ensure:

- Curb elevations, elevations, grade breaks, and other features of the drainage design are consistent with the delineation of DMAs.
- The top edge (overflow) of each bioretention facility is level all around its perimeter—this is particularly important in parking lot medians.
- The resulting grading and drainage design is consistent with the design for parking and circulation.
- Bioretention facilities and other IMPs do not create conflicts with pedestrian access between parking and building entrances.
- Vaults and utility boxes can be accommodated outside bioretention facilities and will not be placed within bioretention facilities.
- The visual impact of stormwater facilities, including planter boxes at building foundations and any terracing or retaining walls required for the stormwater control design, is shown in renderings and other architectural drawings.
- Landscaping plans, including planting plans, show locations of bioretention facilities, and the plant requirements are consistent with the engineered soils and conditions in the bioretention facilities.
- Renderings and representation of street views incorporate any stormwater facilities located in street-side buffers and setbacks.

► **CONSTRUCTION PLAN SUSMP CHECKLIST**

When you submit construction plans for City review and approval, the reviewer will compare that submittal with your earlier Project Submittal. By creating a Construction Plan SUSMP Checklist for your project, you can facilitate the reviewer's comparison and speed review of your project.

PROJECT CLEAN WATER MODEL SUSMP

TABLE 3-2. Format for Construction Plan SUSMP Checklist.

<i>SUSMP Page #</i>	<i>BMP Description</i>	<i>See Plan Sheet #s</i>



Here's how:

1. Create a table similar to Table 3-2. Number and list each measure or BMP you have specified in your Project Submittal in Columns 1 and 2 of the table. Leave Column 3 blank. Incorporate the table into your Project Submittal.
2. When you submit construction plans, **duplicate the table** (by photocopy or electronically). Now fill in Column 3, identifying the plan sheets where the BMPs are shown. List all plan sheets on which the BMP appears. Submit the updated table with your construction plans.

Note that the updated table—or Construction Plan SUSMP Checklist—is **only a reference tool** to facilitate comparison of the construction plans to your Project Submittal. Planning Department staff can advise you regarding the process required to propose changes to your approved Project Submittal.

► CERTIFICATION

Your local municipality may require that your Project Submittal be certified by an architect, landscape architect, or civil engineer.

The certification should state: "The selection, sizing, and preliminary design of stormwater treatment and other control measures in this plan meet the requirements of Regional Water Quality Control Board Order R9-2007-0001 and subsequent amendments."